

INTERNATIONAL REVIEW
OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE
INTERNATIONAL ASSOCIATION
OF POULTRY INSTRUCTORS
AND INVESTIGATORS

EDITOR:
Dr. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

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INTRODUCTION BY THE EDITOR.

As an introduction to this new Periodical I think it best to quote a few passages from the letter, dated 1st. January, 1928, from Mr. F. C. Elford, Chairman of the Association, to the members:

„The functions of the Association naturally fall into two main divisions; „the Congresses, and the work of the Association apart from these „Congresses.

„The Congresses act as milestones and serve to mark progress. They „also dignify and give prestige to the industry, and they present a medium „for international acquaintanceship. There is no doubt that the three „Congresses have done more to elevate the standing of the industry, to „favourably impress governments and the general public, and to extend „good fellowship, than anything else that has occurred in World Poultry „Keeping. It is essential that these Congresses should remain outstanding „events and be of a world wide nature.

„It may be difficult to outline or even visualize the duties of the Asso- „ciation between Congresses. As I see them they are to secure a better „understanding of one another's problems and to extend that goodfellow- „ship that always exists among friends. These duties may be met only „through co-operation, contact and confidence.

„The friendly international relations established must be maintained and „further developed. This can be accomplished only through the fullest „measure of co-operation between those who have actually met each „other at the Congresses. **Direct contact may be out of the question „for many, but it is always possible through correspondence.** Most of „us have as our life's work the further development of the poultry „industry, and through this point of contact we may make our efforts „to co-operate very live and useful. A fuller appreciation of each other's „problems will make for success in our undertakings.

„**The Association is the logical medium of contact,** and in order to „participate in the co-operative effort to the full, to get the closest and

„most immediate contact, both personal and through the medium of „correspondence, and to enjoy the confidence of those engaged in poultry „work, a large association membership is essential.

„Let us make the Association a great clearing house for poultry know- „ledge and international goodfellowship, keeping always in mind the „difficulties and problems of fellow members, and exercising at all times „that measure of tolerance that alone can make for abundant success.

✓ „To make membership more attractive between Congresses, arrangements „have been made with Dr. te Hennepe, Rotterdam, Holland, to edit a „quarterly news sheet known as the INTERNATIONAL REVIEW OF „POULTRY SCIENCE, and have it distributed to members. It is expected „that this sheet will contain items of interest concerning the Association, „a list of poultry publications throughout the world, and, yearly, a revised „list of membership. As far as possible the editor will assist members in „obtaining Government bulletins, etc., many of which contain valuable „data on the poultry industry.”

The object of the Periodical is the bringing into operation of Article II of our Constitution, which reads as follows:

„The objects of the Association are:

1. To facilitate in all possible ways the exchange of knowledge and experience among persons in all parts of the world, who are interested in the advancement of the Poultry Industry, by teaching, demonstration, and investigation.
2. To promote the extension of knowledge in this field by the encouragement of scientific research, practical experiments, the collecting of statistics, the study of the problems of marketing, and the world's markets and in every way possible.

In future we shall endeavour to compile a concise review of all possible scientific data referring to poultry, and distribute this among readers at specified times, thus keeping the readers „au fait” with the results of experiments and research and the steps taken to develop the Industry.

Everybody will understand that this task can only be fulfilled if we received the support of all our readers, so that we now ask them so send us all bulletins, reports, publications and communications in future, as soon as possible after they have been issued. Of course, new books on poultry or articles from periodicals will also be of great service.

As the Periodical is at the same time the Official Organ of the International Association it will also contain items of interest concerning the Association.

To commence with, the Periodical will be published quarterly and **every member of the Association will receive a free copy** as soon as possible after publication.

Seeing that our Association is represented in most every country **the Periodical will have a circulation covering the whole world.**

We shall at all times be pleased to receive any suggestions which might tend to improve the Periodical and lead to its fulfilling its object in the best possible manner.

Yours faithfully,

Dr. B. J. C. TE HENNEPE,

Assistant Secretary for Continental Europe.

ROTTERDAM, 1st. April, 1928.

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BREEDING

Trapnests by F. C. Elford. Dominion Experimental Farms. Circular No. 34. Ottawa 1925.

Selective Fertilization in Fowls, L. C. Dunn. „Poultry Science”, Vol. VI, No. 5. June-July 1927.

The results of these experiments, while not conclusive in respect to selective fertilization, are sufficiently suggestive to warrant extensive experiments designed to establish definitely whether or not selective fertilization in favor of the union of the germ cells of nearly related individuals occurs. Our evidence indicates that sperm competition takes place and this is confirmed by the recent evidence of Crew. The bulk of the evidence is in favor of the probability that selective fertilization does take place, but some of the difficulties attending proof of this hypothesis have been discussed and reasons given why definite conclusions cannot be drawn. The chief difficulties are the variation between individuals in mating behavior, in potential fertility and in other factors not directly connected with relationship and this indicates that a large number of individuals should be used and that each should have been previously tested under the conditions from which the chief factor to be studied i. e. nearness of relationship, should have been excluded. Future experiments should also be designed to elucidate to what factors the results obtained are due. Do sperm live longer or progress more rapidly, for example, in the oviduct of a nearly related individual? This could be determined from a series of timed double copulations, by the measurement of the time required from copulation to fertilization in the case of sperm of near and of distant relatives, and of the order of successive fertilizations as judged by the character of the chicks hatched from eggs laid, 1, 2, 3, 4, 5, etc., days after double copulations.

Finally, other data on fertility and hatchability which emerge from experiments of the sort required for solution of the main problem have been presented in detail and other problems involved have been indicated. Of chief interest among these are (1) the determination of the time elapsing between mating and the laying of the first egg, which in our experiments appeared to average less than forty-eight hours and to have a minimum of about twenty-one hours, (2) the maximum duration of fertility from a single mating which had an average of a little over two weeks and a maximum of about a month, (3) the effect of age of sperm on the viability of the embryos which appeared to be negligible for at least two weeks, (4) effect of order of eggs and age of sperm after mating on the sex of the embryo, for which our data were too meager to be useful and held out scant promise that any striking results would be obtained in respect to sex. In addition to these a host of other interesting problems will present themselves to anyone who has once begun experiments of the type described above. I believe that here is an important, and at present untouched, field for poultry research.

The Canadian Record of Performance for Pure-Bred Poultry Record year 1925-26. Regulations, Standards and Records of Fowls qualified for Certificates. Report No. 7. Dominion of Canada

Department of Agriculture. Live Stock Branch—Poultry Division. Ottawa 1927.

Culling Farm Poultry. Kansas State Agricultural College. Manhattan, Kansas. Different methodes to separate the desirable from the undesirable hens.

Culling Chart.

Judging for present production:

Vent	Laying Hen	Nonlaying Hen
Pubic Bones	Large, dilated, oblong	Small, contracted
Comb	Flexible, wide apart	Rigid, close, together
Wattles and Lobes	Large, red, full, glossy	Small, pale scaly
	Prominent, soft, smooth	Inconspicuous rough and dry

Judging past production:

Vent	Long laying Period	Short laying period
Eyelids	Bluish white	Flesh colored
Eye	Thin, edges white	Thick, yellow
Earlobes	Prominent, keen	Listless, sunken
Beak	Enamel white	Yellow tinted
Face	Pearly white	Yellow tinted
Shanks	Clean cut, sunken	Full, well fleshed
Plumage	White, flat, thin	Yellow, round
	Worn, soiled, lifeless	Signs of molting loose feathered

Judging rate of production:

Keel	Slopes downward	Slopes upward
Pubic Bones	Tips thin	Tips thick
Capacity	Four to five fingers	Two fingers
Abdomen	Soft, pliable, dilated	Fatty, hard, contracted
Rump	Broad, width carried back	Narrow, cramped
Lateral Processes	Prominent, pointed outward	Hard to find pointed inward
Skin	Soft, thin, loose, silly	Thick, dry, underlaid with fat

Studies on the Relation of gonadic Structure to Plumage Characterisation in the Domestic Fowl. II. The developmental Capon and Poularde. A. W. Greenwood and F. A. E. Crew. Proceedings of the Royal Society B. Vol. 101. 1927.

A series of eleven birds is described which throughout their life retained the characters and behaviour of individuals completely gonadectomised before puberty, except that their combs, though diminutive, were bright and healthy looking. Post-mortem examination revealed either complete absence or reduction in the size of the gonads. In such gonadic tissue as was present spermatogenesis was imperfect.

The causes of the gonadic imperfection are discussed. It has not yet been demonstrated whether the imperfection is inherent in the gonad or in the soma.

Poultry breeding Records. Kansas State Agricultural College. Manhattan, Kansas.

The purpose of breeding records should be to answer at least four questions regarding any individual bird which has ever been mated.

These are: 1. Who are its ancestors and what has been their breeding and productive performance?

2. Who are its brothers and sisters?

3. With what individual is it at present mated?

4. What were the results of these matings?

Description of every point here called.

On the Inheritance of some Characters of the Silky Fowl. L. C. Dunn with the cooperation of M. A. Jull. *Journal of Genetics.* Vol. XIX. No. 1. Nov. 1927. Cambridge. University Press.

Contents: Inheritance of: feather form, plumage colour, comb form, crest, polydactyly, leg-feathering, vulture hock, cerebral hernia, shank colour, mesodermal pigment.

The relationship of dermal shank colour and mesodermal pigment.

Association of characters: a: Linkage of hernia and coloured plumage, b: linkage of polydactyly and colour, c: linkage of polydactyly and hernia, d: linkage of rose comb and crest, e: crest and comb form, f: general association of silky characters, Bibliography.

The Occurrence of Chondrodystrophy in Chick Embryos II. The genetic Evidence. L. C. Dunn. *ib.* 110 Bd. 2 Hft.

Inheritance of side Sprigs. V. S. Asmundson. *Journal of Heredity.* Washington. Vol. XVII. August, 1926.

Matings of males with side sprigs to hens with side sprigs ave progeny:

a) all of which had side sprigs,

b) three-fourths with side sprigs,

c) equal numbers with and without side sprigs and in some cases slightly more with than without or approximating a 9:7 ratio.

Males and females without side sprigs produced chicks which had and did not have side sprigs in the ratio 1:3 and 1:1.

Males without side sprigs mated to hens with side sprigs produced progeny nearly onefourth of which had side sprigs. The chickens from all the various types of matings that had side sprigs comprised both males and females.

These facts are interpreted to mean that the presence of side sprigs is determined by the interaction of two dominant factors neither of which is carried in the sex chromosomes.

Correlation between external body Characters and annual egg-production in white Leghorn fowls. Texas Agricultural Experiment Station. Brazos County, Texas.

The fowls that laid the low number of eggs had the greatest amount of yellow in their shanks and beaks.

There is a strong positive correlation between pliability of pubic bones and annual egg-production.

The early molting fowls averaged much poorer in egg-production than did those molting late.

There is a strong positive correlation between capacity and weight and between depth of body and weight.

DISEASES

A New Method of Vaccination against fowl-cholera. Sur une Méthode d'immunisation par résorption lente d'antigènes virulents. M. E. Ducloux et Melle. G. Gordier. Comptes rendus des séances de l'Académie des Sciences. Paris. No. 12. 21 Mars 1927.

By mixing the cholera cultures in vaseline-oil (huile de vaseline) resorption is very slow. Authors got good results in birds by injecting $\frac{1}{21000}$ cubic centimeter of cholera culture in $\frac{1}{4}$ cubic centimeter of vaseline oil.

Report of Committee on Poultry Diseases of the United States Live Stock Sanitary Association. Chicago 1926.

At least two poultry diseases are being proceeded against by a more or less concerted and organized attempt of control. These diseases are tuberculosis and bacillary white diarrhea.

The committee offers recommendations for consideration as a base upon which a standard test of agglutination may be founded. The details are tentative and for the present should not be regarded as otherwise.

* *The Value of various Feeds in the Control of Coccidiosis in chicks.* Texas Agricultural Experiment Station Brazos County. Texas. 1925.

Conclusions: Condensed buttermilk, diluted with water and kept before the chicks at all times is of value in reducing the losses from chicks artificially infected with coccidiosis.

A 1—3 condensed buttermilk reduces mortality more than a 1—6 buttermilk. It is not known whether this is due to a greater amount of acid or to the greater amount of proteins it contains.

Greens did not prove to be of value in reducing losses or in increasing the weight of chicks.

* *Paralysis.* Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde (Veterinary Journal). Tome 54. No. 8. 1927. Utrecht, Holland.

The author gives as his opinion that tapeworms are the principal cause of paralysis in fowls.

The more important Poultry Diseases. L. van Es and H. M. Martin. College of Agriculture Experiment Station. Lincoln. Nebraska 1926.

Short description of different Diseases, Hygiene and Sanitation.

From the microbic diseases are mentioned: Cholera, Typhoid, Bacillary white diarrhea, Tuberculosis, Roup, Pox and Canker, Coccidiosis, Blackhead, Favus.

Also parasitic diseases and parasites are described.

- 7 *Vermicidal Iodine Preparations* by Wallace L. Chandler and Clarence M. Ferguson. Annual Report of the veterinary division of Michigan State College 1927.

Being a presentation of protocols of a series of critical and checked experiments carried out by the Departments of Bacteriology and Poultry Husbandry, Michigan State College, for the purpose of determining the efficacy of various promising iodine preparations designed for ridding poultry of worms.

Conclusions: From the data here presented it would appear that materials consisting of iodine adsorbed to a suitable adsorbent neutral to iodine is entirely efficient in the destruction and removal of intestinal worms in poultry. It would also appear that colloidal iodine containing two per cent iodine may be efficient.

No evidence of inflammation or other pathological lesions, which could be in any sense of the word attributed to the dose, was found in any of the birds examined.

- 7 *How to rid a Henhouse of Mites* by George Robertson, Assistant. Circular No. 59. Dep. of Agriculture. Canada. Ottawa 1927.

Botulism in Fowls, called Limberneck, by R. Graham and I. B. Boughton. University of Illinois. Circular No. 289. July 1924.

A brief statement of the cause of botulism in poultry, how it may be recognized in a flock and how it may be combated.

Fowl-Pest. Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde. Tome 54. No. 11. 1927. Utrecht, Holland.

The author discusses the spreading of fowl pest and how to deal with same. He recommends to destroy all round and sick fowls and to disinfect the localities thoroughly.

Para-cholera in Canary-Birds. Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde. Tome 54. No. 12. 1927. Utrecht, Holland.

The author's investigations show that paracholera in canary birds (with grey-coloured lesions in spleen and liver) is caused by bacillus pseudo-tuberculosis canariensis (rodentium).

- 7 *Helminthiasis in Hen*. Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde. Tome 55. No. 1. 1928. Utrecht, Holland.

The author discusses Helminthiasis in hen, specially those which occur in Holland and how to deal with same.

Echinostomiasis in Pigeons. Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde (Veterinary Journal). Tome 54. No. 9. 1927. Utrecht, Holland.

In Holland a serious enteritis was found in pigeons caused by an invasion of echinostoma (trematodes).

- 7 *Echinostomiasis in Chickens*. Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde (Veterinary Journal). Tome 54. No. 9. 1927. Utrecht, Holland.

In Holland a serious enteritis in hens was found, caused by an invasion of echinoparyphium (trematodes).

Coccidiosis in Hens. Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde (Veterinary Journal). Tome 54. No. 10. 1927. Utrecht, Holland.

In this paper symptoms and treatment of coccidiosis in hens are discussed.

Une Maladie des Pigeons due a un germe du groupe des Salmonella par J. Lahaye et R. Willems. Bruxelles. Annales de Médecine vétérinaire. Juin 1927.

A pigeon-disease caused by a germ belonging to the group of Salmonella.

The germ was cultivated from the inflamed elbow joint of a young pigeon. It was also detected from different pigeons in Belgium. Young pigeons from one to ten days old are suffering under symptoms of septicaemia.

This germ is also infectious for guinea-pigs, rabbits and mice. It resembles most Bac. paratyphosus B type Aertryck. Pigeons suffering from this disease may be dangerous for men.

On the Frequency of Spontaneous Tumours in Poultry. M. Schneider. The Journal of Experimental Medicine. March 1926. Vol. LXIII, No. 3, p. 433.

On an experimental farm of about 11,000 birds an autopsy is made on all birds which die. Tumours are more frequent in the second six months of a pullet's life than in the first. It seems that intensive egg production precedes a period in which the proportion of tumours is above normal. The annual proportion of tumours found in birds of 6-18 months varies from 2-3 %.

Study on Rous' Fowl Sarcoma. Glover, Scott, Loudon and Mac Cormack. The Canada Lancet and Practitioner, No. 2, 1926.

In 1911 Peyton Rous of the Rockefeller Institute obtained the transmission of fowl sarcoma by using filtrates of the tumour. At first he was only successful on fowls of the same variety, but after several passages the virulence increased and he was able to infect a limited number of fowls of other varieties.

In July 1925 Gye and Barnard of London succeeded in cultivating *in vitro* and in taking an ultra microscopic photograph of a virus which seems very akin to that of Rous.

The writers have managed to isolate and to cultivate a pleomorphic organism from fresh tissue of Rous' fowl sarcoma.

This organism filters in one of its phases and it is then invisible with the strongest magnifications of the ordinary microscope. The writers are of opinion that the microbe found by Gye in Rous' sarcoma corresponds to the filtering phase of this organism.

Fowl Pox Prevention by Immunisation. W. T. Johnson. Oregon Agricultural Experiment Station. Corvallis, Oregon. Journal of the American Veterinary Medical Association. Vol. LXXI. Sept. 1927, p. 750.

The application of new principles of vaccination (virus-vaccination) results in absolute immunity.

Immunity following infection has been demonstrated experimentally by a number of investigators. Johnson brushed a virus suspension into the feather follicles of a leg from which the feathers were removed first. These birds proved to be immune.

The subcutaneous vaccination is only recommended for infected flocks but is by no means entirely satisfactory.

Results from the virus-vaccination method are now obtained during the summers of 1926 and 1927 with 20,000 fowls.

This method should not be confused with that used by de Blicke and van Heelsbergen. These investigators claim antidiaphtherin to be a special product, which they use in vaccinating laying stock as well as young and which requires scarification. The method employed in Oregon is not used for laying stock and concerns the use of active, disease-producing virus which is unmodified.

Inoculation on the leg, after plucking some of the feathers was selected because of the susceptibility of the feather follicles and the lessened danger of head lesions. The feather follicle permits of rapid, consistent and convenient inoculation.

Conclusions: Virus-vaccination may be successfully used in commercial flocks to prevent fowl pox.

This method produces immunity against experimental as well as natural infection.

➤ *Bacillary white Diarrhoea of Chicks. (B.W.D.)* T. Dalling, J. H. Mason and W. S. Gordon. The Veterinary Journal. Nov. 1927. p. 555.

Summary:

1. Fowls up to one year old have been infected by feeding large volumes of *B. pullorum* broth culture.
2. Non reacting cockerels may be made to react to the agglutination test by intravenous or intratesticular injections of *B. pullorum*. Such cockerels do not appear to transmit infection to hens mated with them.
3. Natural and artificially infected hens do not appear to transmit infection to normal hens in the same pens or to chicks bred from clean stock when placed in contact.
4. A clean cockerel mated with infected and clean hens does not appear to cause infection of the clean stock.
5. A considerable variation in the agglutination titre of fowls serum may occur from time to time, and there is evidence that a strongly positive hen whose ovary contains *B. pullorum* may at times show a negative agglutination reaction.
6. Various methods of making antigens for use in agglutination tests have been the subject of experiment.
7. *B. pullorum* was recovered from about 4 % of the eggs laid by natural and artificial „carrier” hens.
8. In our hands, as far as agglutination is concerned, *B. pullorum* and *B. gallinarum* are identical.

Acute Infection of Chicks and chronic Infection of the Ovaries of Hens caused by the Fowl-Typhoid Organism. J. R. Beach and D. E. Davis. Hilgardia. California Agric. Exp. St. 1927, p. 411.

These studies demonstrate that *Bact. sanguinarum* may produce an acute, highly fatal disease of young chicks and a chronic infection of the ovaries of hens which cannot be differentiated from disease of chicks and ovarian infection of hens caused by *Bact. pullorum* except by the difference in the cultural characteristics of the organism isolated from affected birds. Agglutinins occur in the blood serum of hens that are infected with *Bact. sanguinarum*. However the ordinary routine agglutination test does not serve to differentiate between ovarian infection with *Bact. sanguinarum* and *Bact. pullorum* because serum from a hen infected with the former will cause agglutination of antigens prepared from either of the two species of organisms.

Experimental Research on diphthero-variolic Infection of Birds.

Jean Verge (Chef de travaux à l'Ecole d'Alfort). Recueil de Médecine Vétérinaire, Alfort, 1926, t. CII, No. 11.

Verge in a thesis of 250 pages gives the result of his researches regarding the diphthero-variolic infection of birds, in some of which he was assisted by Panisset.

Apart from an exact and comprehensive documentation, the wealth of which is shewn by a 25 page bibliographical index, the thesis is primarily a description of experimental research. The process of inoculation which is described by Verge is now practised; more than 100,000 inoculations attest its value and have proved that the immunity conferred is fixed and lasting.

Klein Disease and B.W.D. Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde (Veterinary Journal). Tome 54. No. 6. 1927. Utrecht, Holland.

The connexion is treated which is likely to exist between pullorum infection — oviduct inflammation — interior bleeding and Klein's disease. Further the author describes the diagnostic and the combating of the pullorum-disease.

Pullorum-Infection in adult Hens. Dr. T. van Heelsbergen. Tijdschrift voor Diergeneeskunde. Tome 54. No. 17. 1927. Utrecht, Holland.

In this paper the author describes in detail the consequences of Pullorum-infection in adult hens and how to deal with same.

The Elimination of cloudy Reactions by the use of Formalin as a preservative for Bacterium Pullorum Antigen by J. R. Beach and S. Ter-Michaelian. Hilgardia. April 1927. California Agric. Exp. Station. Berkeley, California.

Discussion: The results of the 4322 comparative tests indicate that antigen containing 0.1 per cent formalin is satisfactory for making agglutination tests of blood serum from fowls. There was little difference in either the number or distribution of the sera which reacted with the two antigens. In the tests in which four dilutions were used and in which reactions to both antigens in at least one dilution were obtained, more sera caused agglutination in the 1 — 100 and 1 — 200 dilutions of formalized antigen than in the corresponding dilutions of phenolized antigen.

The cloudiness which occurred in 1700 tests with phenolized antigen did not appear in the corresponding tests with formalized antigen. In this respect, the formalized antigen was more satisfactory than the phenolized antigen.

It was observed that the clumps of bacteria formed by the agglutination of the organisms in the formalized antigen were smaller and more easily broken up than the clumps of bacteria in the phenolized antigen. This was of no importance when complete agglutination occurred, but did make the reading of partial agglutinations more difficult in the formalized antigen than in the phenolized antigen. This feature of the behavior of formalized antigen, however, is an unimportant source of error in the interpretation of agglutination reactions when compared with the frequently-occurring cloudiness of phenolized antigen.

Variation in the Reactions obtained in repeated Agglutination Tests of the same Fowls with Bacterium Pullorum Antigen by J. R. Beach. Hilgardia. Journal of Agric. Science. April 1927. California Agric. Exp. Station. Berkeley, California.

Conclusions: This paper presents the results of the first twelve of a series of at least twenty-four monthly agglutination tests of the same fowls for the detection of Bact. pullorum infection, together with the results of the bacteriologic examinations of the fowls that have died during the twelve month period. Complete interpretation of the results of these tests cannot be made until the experiment is terminated and a postmortem and bacteriologic examination is made of all of the fowls. The information obtained from the results of the first year of the experiment, however, would seem to warrant the following conclusions:

Adult fowls with well-established ovarian infection with Bact. pullorum may not always react to an agglutination test. This factor seriously affects the dependability of the agglutination test as a means of detecting Bact. pullorum carriers and therefore detracts from the practical value of the tests as a means for the complete eradication of the infection from a breeding flock.

A fowl that has reacted to an agglutination test may not react to subsequent tests even though it is still infected with Bact. pullorum. Therefore, a fowl that has once reacted to a test cannot be considered as free from the infection if it fails to react to tests that are made subsequently.

A positive reaction to the agglutination test may be considered as a highly accurate indication of Bact. pullorum infection. A negative reaction to a test, however, appears to less accurately indicate freedom from Bact. pullorum infection, either recently acquired or of long standing.

In an agglutination test procedure with an antigen of equal or greater density than that used in these studies, a serum-antigen dilution at least as low as 1—25 should be included. Clearing of the 1—25 dilution alone or accompanied by clearing of one or more higher dilutions of the same serum can be interpreted as a positive reaction.

No information regarding the interpretation of proagglutination or paradoxical reactions was obtained in these studies since this phenomenon was not encountered.

A simple and effective System of Management for the Control of Bacillary White Diarrhea by Roy H. Waite. The University of Maryland Agric. Exp. Station. Bulletin No. 274. July 1925.

Summary and conclusions: The life history and character of the disease known as Bacillary White Diarrhea has been rather thoroughly worked out by the careful investigations of Rettger and others who have worked with him.

It is rather well established that the proper control of the disease lies in breaking up the cycle of infection described by Rettger.

Practically all the noteworthy work done towards establishing the nature and character of the disease has been done in the laboratory, therefore, it does not seem strange that the present control methods are almost entirely based on laboratory practice.

Owing to natural limitations that occur when applied under practical conditions, laboratory methods so far developed for the control of Bacillary White Diarrhea are no „sure fire” proposition. Where infection is present in a flock it requires a systematic series of tests to free a flock from the disease.

The experience at the Poultry Plant of the Maryland Experiment Station leads to believe that the disease can be prevented, controlled and eliminated from a flock by a simple, continuous method of attack and control, all the practices of which are good general management in themselves.

This system of management is set forth and described under an appropriate heading in the foregoing pages.

NUTRITION

Comparative Influences of Various Protein Feeds on Laying Hens.

Texas Agricultural Exp. St. Bulletin No. 317. Febr. 1924.

This bulletin embodies the data secured in the experiment of using cottonseed meal instead of animal products as a source of protein for laying hens. The results warrant the recommendation of freshly ground cottonseed meal as a substitute for meat-scrap and tankage in rations for laying hens.

The ration in which cottonseed meal gave the best results was: wheat bran 125 pounds, gray wheat shorts 75 pounds, corn meal 75 pounds, and cottonseed meal 120 pounds.

Data are also given showing that with hens given feeds containing only limited quantities of fat-soluble A for a period of seven months and three weeks the mortality was very high and the egg production was low. The greatest mortality and the lowest egg production occurred during the last seven weeks of the experiment.

Soy Bean Oil Meal in Rations for laying Pullets. Purdue University. Agric. Exp. Station. Lafayette. Indiana. Bulletin No. 293. May 1925.

Summary:

1. Soybean oil meal proved to be a satisfactory source of concentrated protein in a laying mash when supplemented by the proper mineral mixture.
2. Soybean meal as the only source of concentrated protein in a laying mash was unsatisfactory in producing eggs unless supplemented by some mineral mixture.
3. Tankage was a satisfactory source of animal protein in a laying mash and needed no additional minerals.
4. One-fourth to one-half of the required amount of tankage in a laying ration was replaced by soybean oil meal with satisfactory results.
5. When soybean meal was used as the only or up to one half of the source of concentrated protein in a laying mash it was advisable to supplement it with a mineral mixture.
6. Steam bone meal by itself was not a satisfactory mineral supplement to soybean oil meal.
7. The mineral mixture that was the most satisfactory consisted of 24 pounds limestone and 15 pounds salt with either 21 pounds soluble bone, 22 pounds steam bone or 42 pounds acid phosphate when fed with soybean oil meal.
8. In using a vegetable protein such as soybean oil meal, eight to 10 per cent was the amount of mineral mixture added to the mash.
9. In making a mineral mixture to supply the elements, calcium, phosphorous, sodium and chlorine, the cheapest sources were limestone, acid phosphate and salt.
10. Ground whole soybeans was as satisfactory as soybean oil meal when used in place of tankage in a laying mash, provided a mineral mixture was added. The same was true of cotton seed meal and gluten feed.

The Rate of Passage of Food through the Digestive Tract of the Hen by M. Helen Keith, L. E. Card and H. H. Mitchell

Journal of Agricultural Research. Washington. April 15. 1927.

Summary: Determinations have been made of the amount of dry matter contained in the various segments of the digestive tract of hens at different intervals after the ingestion of 50 gm. of whole corn, ground corn, or a mixture of ground corn and tankage in the ratio of 4 to 1.

The results indicate a wide variability in the rate of passage of the food through the hen. In most cases, however, the whole corn had left the crop by the end of 12 to 15 hours. The ground corn remained in the crop distinctly longer than the whole corn and somewhat longer than the mixture of corn and tankage. The amount of dry matter in the other sections of the digestive tract did not differ notably for the three kinds of feed used. The amount of dry matter in the gizzard in addition to the grit was larger while food remained in the crop than later, and to a less extent the same was true of the small intestine. Otherwise the amount of dry matter in the intestines was fairly constant.

The percentage of moisture in the contents of the crop showed a wide variation, apparently independent of the kind of feed eaten and of the time after feeding. The percentage of moisture within the gizzard was low and rather variable, being about 30 to 60 per cent, with an average of 44.2 per cent. The amount was not a reflection of the amount in the crop, but was usually about one and one-half to two times that of the dry matter not grit present. The percentage of moisture within the small intestine was high and remarkably constant at about 82 to 86 per cent, with an average of 83 per cent. That in the caeca was about 70 to 80 per cent of the total contents, with an average of 76.4 per cent; and that in the large intestine was about 75 to 85 per cent, with an average of 78.9 per cent.

The amount of grit found in the gizzard varied widely, the usual range being from 3 to 15 gm. No connection was observed between the quantity of grit present and any other factor or condition.

Vitamin A in Poultry Flesh and Fat. R. Hoogland and A. R. Lee.

Journal of Agricultural Research. Washington D. C. July 1926.

The flesh from one lot each of ducks and of guinea fowls was found to be relatively rich in vitamin A. One sample of chicken flesh contained a fair amount of this vitamin, but the other samples of guinea fowl, duck and chicken flesh, and both samples of goose or turkey flesh, were relatively poor in vitamin A.

In each instance it was found that the sample of poultry fat was considerably richer in vitamin A than the corresponding sample of flesh.

Poultry Feeds and Feeding by George Robertson. Dominion of Canada Dep. of Agric. Bulletin No. 1. New Series. Ottawa 1925.

It has been the endeavour to make the subject of feeds and feeding as simple as possible. While it has seemed advisable to try to familiarize the uninformed reader with the more common scientific terms, this has been done only to such an extent as will permit the reader to study and mix feeds intelligently. Wherever terms that might be unusual to ordinary poultry keepers are used, care has been taken to explain them as simply as possible, so that any person reading the bulletin through should have no trouble in following it.

While sample rations are given for each kind of stock, it must not be supposed that these are given as the only rations or even as the best rations. They are simply indications of about what the various rations might consist. The make-up of a ration should depend altogether on what feeds are available, always bearing in mind the various requirements.

EXTENSION

Lehr und Versuchsanstalt für Geflügelzucht Halle-Cröllwitz 1928.
4e Auflage. (Experiment-Station Halle-Cröllwitz, Germany).
Description of the poultry experiment-station, teaching-school
for poultry students and laying-tests.

Poultry Service in Canada (Quebec Province). J. D. Barbeau,
L'Aviculture au Canada, La Vie agricole et rurale, a. 16, t.
XXXI, n. 33; 14 août 1927).

The Provincial Poultry Service was definitely organized in the Province of Quebec in 1914. Its precursor had been the Experimental Union of Quebec Agriculturists, which had already organized and directed 22 Poultry Breeding Stations. From the time of the foundation of the service until 1927, 167 poultry stations were founded, of which 53 still function, and 23 incubation centres were established, of which 11 are still running, with an individual capacity varying from 3,000—16,000 eggs. The Service's activity shewed itself during this period in many ways: — participation in poultry shows; distribution of eggs to village school children and to house-wives' clubs; popular poultry courses, poultry competitions in the farms; „poultry days" in centres where pure strains of the domestic fowl are scarcely known; selection of birds; construction of demonstration fowl houses; regeneration of turkey strains; instruction by the medium of special publications, etc.

The results obtained may be summarized as follows: — Introduction into every county of so called independent or „cold poultry houses"; race improvement by introduction of pure blood; more scientific feeding thanks to growth of special crops and the use of bone crushers; production of autumn and winter eggs as the result of scientific methods of rearing; development of incubation and of artificial rearing which assist the production of eggs at times when otherwise impossible; the sale of eggs and birds by cooperative methods and payments according to the quality of the fowl; methodical fattening and proper preparation for market; regeneration of turkey strains; increase in the number of farmyard poultry in the province from 5,053,038 to 7,354,000, i. e., by 42.7 %.

Report of the Dominion Poultry Husbandman for the year 1926.
F. C. Elford. Dominion of Canada Dep. of Agric. Ottawa 1927.

Table of contents: General Conditions, Work of the Division, Breeding, Experimental Work, Hatching Summary, Duration of Fertility, Ultra-Violet Rays in Incubation, Moisture in the Incubator, Starvation Period for Chicks, Vitamine Feeds and Varied Rations, The Effect of Sunlight upon Growth of Chicks, Vitamine Feeds for Rearing, Feeding Experiments for Winter Egg Production, Home-mixed vs. Commercial Grain and Mash, Ultra-Violet Rays for Egg Production, Vitamine Feeds for Winter Egg Production, Semi-solid vs. Fresh Buttermilk, Substitutes for Fresh Buttermilk, Substitutes for Fresh Greenfeed, Feeds for Fertility, Hatchability, and Viability of Chicks, Experimental Work on the Branch Farms, Experimental Work with Waterfowl, Duck-Feeding Experiment, Comparative Rate of Growth of Different Breeds, Comparative Rate of Growth of Geese, Poultry Diseases, Canadian National Egg-Laying

Contests, Field Work in Quebec, Farm Egg and Poultry Accounts, Demonstrations and Exhibits, Wild Geese Experiment, New Projects.

Report of the 4th and 5th annual Canadian National Egg-Laying Contests by F. C. Elford and A. G. Taylor. Dominion of Canada. Dep. of Agric. Bulletin No. 56. New Series. Ottawa 1925.

General: The purpose of the laying contest, Contest development, Houses and yards, Changing the contest, Contest egg-weights, Registration, Key to varieties, Rules and regulations.

Part I—1922-23: Contest reports, Variety averages, Table showing production costs, for each contest, Mortality.

Part II—1923-24: Contest reports, Variety averages, Table showing production costs, for each contest, Prizes, Mortality, Five years' summary, Average of averages (five years), Selection of contest pens, The development of the pullet, Registered birds, Registration qualifications, The registered male bird.

GENERAL

A Survey of Poultry-Farms of British Columbia by W. J. Riley, E. A. Lloyd and V. S. Asmundson. Dep. of. Agriculture, Victoria B.C. Bulletin No. 102. 1927.

The chief object of this bulletin is to analyse the capital investment and to describe the returns that have been made from commercial poultry farms in B. C. The report is based on 409 farm records which were obtained from farms representative of the average conditions in the Lower Fraser Valley and on Vancouver Island during the period from Januar 1st 1921 to October 31st 1925 inclusive.

Regulations made under the provisions of the Live Stock and Live Stock Products Act 13—14, George V., Chap. 18, respecting The Grading and Marking of Eggs, printed by F. A. Acland. Ottawa, Canada. 1924.

How to caponize by G. Robertson and W. W. Lee. Dominion of Canada. Dep. of Agric. Pamphlet No. 12. Ottawa 1925.

The Poultry Club Year Book 1928 by William Rice. London, Ludgate Broadway. E.C. 4. Contains names of the Committee, Poultry Calendar and Rules of the Poultry Club.

Iowa College Reports on Glass Substitutes. Poultry Tribune for March, 1928.

A series of experiments extending from November, 1926, to May, 1927, at the Iowa State College Poultry Department, tested the efficiency of window glass and window glass substitutes in the rearing of baby chicks.

Four lots of 26 chicks each were reared to ten weeks of age. Each lot was exposed to the rays of the sun under different window glass substitutes. One lot was exposed under window glass and one under direct sunlight coming through poultry netting to test the efficiency of the substitutes.

During the first test which extended from November, 1926, to February, 1927, the chicks received approximately 64 hours of exposure. In the second test which extended from February 19, to May 14, the average exposure totaled 97 hours. This increase in exposure was due to the change in season which permitted more frequent and more prolonged exposure. On cloudy days when the value of exposure was doubtful, birds were not exposed.

Findings of the experiment indicate that there is a variability in the efficiency of the manufactured substitutes. Such a variability of course, is expected in all manufactured products and is only natural. It was definitely established that the admittance of 12 per cent of the beneficial rays of the sun as measured by the lithophone test was sufficient to prevent leg weakness when a well balanced ration was fed. As the efficiency of the substitutes used varied

from four to 30 per cent approximately, some admitted enough ultra violet rays to prevent leg weakness while others did not.

Apart from finding the efficiency of the various substitutes the experiments served to bring out definite recommendations for the proper use of glass substitutes. They follow:

1. Glass substitutes, whenever used, should always be placed in a vertical position.
2. For best results glass substitutes should not be used for openings in roofs or any slanting surface.
3. Glass substitutes used on frames should be securely tacked and firmly braced to prevent whipping.
4. Make all frames removable so they may be stored away from the hot sun and dust during the summer.
5. Glass substitutes admit little if any air, therefore, the house must be ventilated properly to obtain the best results.
6. Glass substitutes should be kept free from dirt and dust.
7. When window glass or glass substitutes are used, *Direct Sunlight* should be admitted whenever possible.

An Economic Study of Poultry Farming in Western Washington
by George Severance. State College of Washington Agric.
Exp. Station. Bulletin No. 216. June 1927.

The rapid growth of the poultry industry in Western Washington with the marked development of specialization, making many operators wholly dependent upon the receipts of the poultry for their living, led to the present study of the Economics of Poultry Farming in Western Washington. An effort has been made to point out some of the factors affecting the stability of the industry as a whole, to ascertain the results being secured by the individual poultrymen and to study features of management that affect the labor income of the individual operator.

The report is based upon 53 complete farm records* and 54 enterprise records covering the year from October 1, 1923, to October 1, 1924, as well as 60 complete farm and 35 enterprise records covering the year October 1, 1924, to October 1, 1925, Statistical data from the Federal Census, the Federal Bureau of Agricultural Economics and the Extension Service of the State College of Washington were used also. Records were secured only from farms on which poultry was maintained on a commercial scale, and where the production of market eggs was a major poultry enterprise.

Since the Washington Cooperative Egg and Poultry Association consented to furnish complete records of sales and purchases of members who were willing to give their financial records, the farm records were secured principally from members of the association as this insured very accurate data. Such records were secured by personal interview on each farm from patrons of the receiving stations at Lynden, Bellingham, Seattle and Tacoma. This source of records was believed to be representative of the industry. Chart number 1 shows the location of the farms visited.

* A complete farm record includes a complete inventory of investment (land, buildings, stock, and equipment) and all receipts and expenses from which the net financial results of the year are computed. An enterprise record in this survey is limited to poultry.

Poultry Notes. A. Tuason. Manila 1925.

Short description of breeding, housing, feeding, culling, caponising, pre-serving eggs.

Incubation and Brooding of Chickens by F. A. Jull and A. R. Lee.
Farmers Bulletin No. 1538. U. S. Department of Agriculture.
Washington, 1928.

The reproduction of the flock from year to year is one of the poultry raiser's most important problems.

To insure best success in incubation and brooding, the hatching eggs must have come from breeding stock of the highest possible quality and free from disease.

The use of the incubator and the brooder is recommended as the most economical and labor-saving way of reproducing the flock.

The best conditions of incubation are provided by proper temperature and ventilation and an adequate supply of moisture.

The most favorable conditions of brooding are provided by proper temperature according to the age of the chicks and climatic conditions, plenty of room, not more than about 350 chicks in one brooder house, good ventilation, and clean houses and soil.

This bulletin is a revision of and supersedes Farmers' Bulletins 1363 and 1376.

Artificial Chick Raising. Jose G. Guevara. Manila 1926.

Contents: Introduction, selection of eggs, the mother hen, the brooder; feeding, care and management, minerals and water.

Brooding and Rearing of Chicks by Geo. Robertson. Circular No. 35. Dep. of Agriculture. Canada, Ottawa 1927.

The brooding and rearing of chicks is a comparatively simple matter, but to be successful requires eternal vigilance and attention to details. Brooding may be divided into two branches, viz., natural and artificial. Much of the success of either system depends on having chicks that are properly hatched from healthy, vigorous parents.

Description of Natural and Artificial Methods and Feeding System.

Fox Ranching in Canada by J. A. Allen and G. Ennis Smith.
Dominion of Canada Dep. of Agric. Bulletin No. 12. New Series 1926.

Section I: Construction of Ranches, Management, Sanitation and Diseases of Foxes, by J. A. Allen, Animal Pathologist in Charge, Fox Research Station, Charlottetown, P.E.I.

Section II: Scientific Nutrition and the Feeding of Foxes in Captivity, by G. Ennis Smith, Nutritionist, Geneticist and Superintendent, Experimental Fox Ranch, Summerside, P.E.I.

Turkeys. Their Care and Management by A. G. Taylor. Dominion of Canada Dep. of Agric. Bulletin No. 46. New Series. Ottawa 1927.

Contents: Introduction, Origin and History, Breeds of Turkeys: Bronze, White Holland, Narragansett, Black, Slate, Bourbon Red, Management: The Breeding Stock, Housing, Feeding, Laying, Hatching, Taking off the Brood, Feeding the Poults, Shooting the Red, Fattening, Dressing, Diseases: Pneumonia, Roup, Blackhead.

Eggs: Their Value as a Food and Their Place in the Canadian Diet by T. A. Benson and S. C. Barry. „The Breakfast Food of the Nation”. Dominion of Canada. Department of Agriculture. Pamphlet No. 59. Ottawa 1927.

Contents: Science approves culinary methods, the natural function of eggs, the breakfast food of the nation, eggs have great food value, protein in eggs, recipes, minerals and other valuable elements in eggs, vitamins in eggs, the care of eggs in the home, buying eggs by quality, some interesting facts about the egg.

Republished by direction of the Hon. W. R. Motherwell, Minister of Agriculture, Ottawa, 1927.

The Candling of Eggs by W. A. Brown and W. H. Ault. Circular No. 41. Dep. of Agriculture, Canada, Ottawa 1928.

Some Factors affecting the Weight of Eggs. Horace Atwood. College of Agriculture. West Virginia University 1926.

In these experiments the eggs attained almost their full weight during the second laying season. The increased weight for the second year as compared with the weight for the pullet year was approximately 9 per cent.

The average size of the eggs laid by a bird is a fixed definite and persistent characteristic.

The size of eggs depends in part at least, upon the character of the ration fed. A ration consisting of whole grain only fed in winter reduced the weight of the eggs about 12 per cent.

As a rule the greater the productive capacity of a bird the smaller is the average decrease in the weight of the eggs which are laid on consecutive days.

During the period of maximum production the decrease in the weight of the eggs laid on consecutive days is at a minimum.

INTERNATIONAL REVIEW OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE
INTERNATIONAL ASSOCIATION
OF POULTRY INSTRUCTORS
AND INVESTIGATORS

EDITOR:
Dr. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

INTERNATIONAL REVIEW OF POULTRY SCIENCE

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ROTTERDAM, (Holland) July 1928.

It gives me great pleasure to be able to inform you that the first number of our Review has been received with feelings of interest and appreciation.

Numerous letters have reached me from various countries containing inquiries relative to the membership of our Association.

For the second Number I have made a request to our past President, Dr. Brown, and to our present President, Mr. Elford, to give a citation of the history and present standpoint of our Association. Both gentlemen were willing to accede to my wish and therefore I have the satisfaction of forwarding them to you.

In order to bring our Council into closer contact with our members, I intend to publish in the following numbers photographs of the former.

To my regret the portrait of our past President is not yet available for the July-number so that I am obliged to limit myself to the one of our President, Mr. Elford.

Again, I ask all those interested in the work of our Association and in the International Review to co-operate with me and forward all publications relative to poultry science at the earliest possible date.

Dr. B. J. C. TE HENNEPE,
ROTTERDAM.

THE INTERNATIONAL ASSOCIATION OF POULTRY INSTRUCTORS & INVESTIGATORS.

BY

Dr. EDWARD BROWN

HONORARY PAST-PRESIDENT

The inception of the wider view which led to the formation of the International Association was due to the American Association of Instructors and Investigators in Poultry Husbandry, now the Poultry Science Association. At its Annual Meeting held in 1910 it was decided to seek for the formation of a central body which would bring together those engaged in Poultry Education and Research in all countries for co-ordination of efforts and dissemination of results and experience gained. Enquiries made indicated that the proposal was favourable received, and at the meeting of the Association named in 1911 arrangements were made that an International Conference should be held to definitely establish a world wide organisation for promotion of the objects as stated.

In accordance therewith this Conference was held in the Council Room of the Royal Agricultural Society, London, England, at which nearly twenty countries were represented, July, 1912. At that the International Association of Poultry Instructors and Investigators was formed, its Constitution adopted, and the first Council elected, with myself as President and Dr. Raymond Pearl as Secretary. The basis laid down was very wide, namely,

1. To facilitate in all possible ways the exchange of knowledge and experience among persons in all parts of the world who are interested in the advancement of the Poultry Industry by teaching, demonstration, and investigation.

2. To promote the extension of knowledge in this field by the encouragement of scientific research, practical experimentation, the collection of statistics, the study of the problems of marketing and the world's markets, and in every other way possible.

It has been said that „A new institution is but a new opportunity". Those on whom the responsibility had been imposed

realised something of the magnitude of the task undertaken. Apart from the question of language, with some exceptions there was no recognition of the important part which Poultry Husbandry could share in human progress. It had been regarded either as a sport or a minor pursuit of small economic value. Experience, however, had increased to the extent that showed the multitude of problems presenting themselves as production had increased, demanding study and the finding of solutions if a larger measure of success was to be achieved. Such would rapidly increase with further advance. These included breeding, methods, disease, and disposal of the produce. To educate producers in the adoption of improved methods so that they might avoid the many pitfalls presenting themselves, was recognised as of supreme importance. Before doing so, however, there was the need for scientific research with a view of arriving at some degree of proved knowledge. With a very few exceptions the opportunities for scientists to devote themselves to poultry research were denied. Such as did so found there was no career in that field. Whatever was done was at considerable personal sacrifice. Further, the time had not arrived when those engaged in breeding and production had realised how great a service could be rendered to them by scientists.

It was evident, therefore, that the primary object must be to convince governments and institutions that Poultry Husbandry was capable of great development, and that in its progress was involved that of their respective communities. Governments alone could provide the funds for research and for education. At the same time it was essential that present and potential breeders and producers should recognise how great a contribution higher education and research can make in their future extension and success.

How what is thus set forth could be accomplished demanded careful consideration. It was decided, and as events have proved rightly so, that there should be held a World's Poultry Congress, for which invitations be issued to all countries. After many negotiations an invitation was given by The Netherlands Government for the first of these assemblies to be held in that country, the date of which was fixed for 1916. The honour is, therefore, that of the Queen and Government of Holland for so readily and generously leading the way, and at a time when no one could foretell whether it would justify them in the labour and expense involved. Then there came the Great War so that the project had to be abandoned. In March, 1919, an International Poultry Conference was held in

London, by which time the Netherlands Government had renewed its invitation. The First World's Poultry Congress was held at The Hague in 1921, the Second at Barcelona, Spain, in 1924, and the Third at Ottawa, Canada, in 1927. With these in each case were associated Exhibitions which have formed most attractive features, giving an opportunity for the countries participating to demonstrate what they are doing in education, research, and production, and to display their breeds of poultry. These are not poultry shows of a competitive nature, of for trade purposes, but for the dissemination of knowledge. To limit them to the former would destroy their character, and limit their influence.

From the outset these World's Poultry Congresses have proved to be a remarkable success. Each after the First has marked a step in advance of its predecessor. That is not alone in the countries where held but in the influence exerted elsewhere. Governments have recognised the value of Poultry Husbandry from its economic and social aspects, and as contributory to the food resources of their respective countries. As a consequence these are to an increasing extent providing opportunities for instruction and research, and study of disease, as well as organisation for sale of produce. Institutions and societies are sharing in development of this branch. Scientists of high attainments are devoting themselves to its problems. The attention of peoples of all classes has been turned to the form of live stock which is within the compass of every section of the community.

Although there is much which remains to be done by the International Association in extension of its membership, in co-ordinating experiments and research, in dissemination of information respecting conclusions arrived at, in prevention of disease, and, generally, in promotion of Poultry Husbandry, the foundations have been laid. The formative period was necessary. It is now passed. We may anticipate that progress in these directions will be at an accelerated pace.

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TO THE MEMBERS OF THE INTERNATIONAL ASSOCIATION.

BY

F. C. ELFORD, President.

Editor te Hennepe has allowed space in this, the second edition of the International Review for a few words from the President.



This space is appreciated, for the President wants to keep in touch with the members and the Review offers an ideal medium to maintain this connection, also to keep the members informed as to international matters that may be of interest to them.

There are several definite things that I want to discuss, they are:

1. Business transacted by the European Executive Meeting held in Paris in February.
2. The Finances of the organization.
3. Preparation for the 1930 Congress.

THE EUROPEAN EXECUTIVE MEETING.

At an executive meeting held during the 1927 Congress in Canada, it was thought, that as many of the international members resided in Europe, there might well be provided the machinery for calling together a Continental European Executive. Consequently Prof. Castello, Barcelona, Spain, who was already Vice-President of the organization, was named First Vice-President for Continental Europe. Later Prof. Castello very kindly accepted this responsibility.

The appointment of a Continental Secretary was left until I

assumed office Jan. 1, 1928. However, before the appointment actually took place, the calling of an European Executive Meeting in Paris, was considered. As a result, the appointment of the Secretary was left to this meeting, which met in Paris on February 17.

At this meeting, five countries were represented. Spain by Prof. Castello; France by Prof. Charles Voiteiller; Holland by Drs. De Blicke and te Hennepe; Germany by Drs. Schachtzabel and Weinmiller; England by Dr. Edward Brown, P. A. Francis and T. N. Robinson.

The Assistant Secretary: One of the first acts of the meeting was the consideration of an Asst. Secretary. The name of Dr. B. J. C. te Hennepe, Rotterdam, Holland, was suggested and the meeting unanimously appointed him as Asst. Secretary for Continental Europe. Dr. te Hennepe is Editor of the International Review and for this reason and others, the new appointment seems a very happy one as there will be much in common between the two offices.

A Visit from the President: The advisability of a visit by the President to a number of the countries, prior to the 1930 Congress, was considered. This visit is for the purpose of discussing with the officials of these countries, the work of the International Association, with special reference to the 1930 Congress. In this connection, let me say that, in accordance with this recommendation, I contemplate, taking the opportunity of visiting a number of countries this year and also next year. Those, that I thought of visiting this year, were the British Isles, France, Belgium, Holland, Switzerland, Germany and Denmark, and if time permits and arrangements can be made, to include several other of the more northern European countries. Next year, I hope to have the pleasure of visiting the more southern European countries.

In connection with this year's visit, it seems most likely that the time will be late August or early September, when I reach London, where I hope a number of the European Directors will meet me. Further, I would like to meet any of the members of council in each of the countries visited, and also governmental officers, who may be interested in the work of the Association. As soon as the time of the visit is determined, I will be pleased to communicate with the members of council in each of the countries, when more definite arrangements for the visit may be made.

It is expected that Mr. Percy Francis of England will accompany me upon these visits and possibly the Vice-President and the Asst. Secretary for Continental Europe may be induced to share the visit to at least some of the countries.

The 1930 Programme: The handling of the sessions, the halls, the official languages, the exhibits and many other matter, were discussed at the meeting. These will not be commented upon here, further than to say, that though such matters as these are left to the country, holding the Congress, I am quite sure that Mr. Francis and others in England, who may be responsible for the 1930 Congress, will be pleased to have all the suggestions possible from the directors of the members.

The International Review: It was announced that a quarterly publication would be published and distributed free to the members. This Review, containing as it will, the latest information relating to the World's Poultry Work, should become a very vital factor in the life of the Association. You have secured the first edition, this is the second. It is expected that each edition will be an improvement upon the last. Following the first appearance, there has been considerable demand for the publication, coming from libraries, publishers and others. Because of this demand, the circular letter of May 30, was addressed to members of council. The matter will be discussed at the meeting of Executive, that will be called in England upon my visit later this year. In the meantime, let me say that replies to this letter still will be appreciated.

FINANCES.

As yet, only a few replies have been received from the Directors to my letter of May 3rd, concerning the finances of the Association. This letter was addressed to the directors only, but suggestions will be welcomed also from members. The suggestion was made in this letter, that countries be asked to contribute a stated sum yearly to the Association. Some valuable suggestions have been received and it is hoped that something decidedly helpful will be put before the Executive meeting in England early in September.

PREPARATION FOR THE 1930 CONGRESS.

It is unlikely that many countries have made definite steps towards participation in the 1930 Congress. The probability is that most countries hesitate to make a move, until the official invitation has been received. I would like to urge however, that all who expect to participate, begin to prepare at once. Sometimes it is difficult to get such things as invitations out on time. I think it would do no harm for those interested to act at once and accept the invitation when it comes.

It may be of interest to know that Canada has already attempted to create a feeling favorable to attendance upon the Congress. This is being done by advertising an all expense Congress tour. A suggested itinerary has been prepared by the Canadian National Railways, allowing a total absence from Canada of seven weeks; five weeks in Europe. This provides for attendance at the Congress followed by visits to England, Ireland, Scotland, France, Belgium, Holland, Switzerland, Germany, and possibly Denmark. The idea of having this announcement made so soon, is to prepare people for 1930. With the information that an all inclusive expense trip can be made at a comparatively low cost, a good many Canadians believe they can go and already are making preparations to be present at the Congress and also see a few other countries while across the water.

Let me conclude by expressing the hope that this International Association, through its official organ, the Review and otherwise, may be the means of assisting many in advanced poultry work and especially in cementing international friendships already made and of making many other friendships.

F. C. ELFORD,
President.

BREEDING

The Canadian Record of Performance for Poultry. Report for Record Year 1926-1927. Ottawa, Canada.

The eighth year of Record of Performance work has proven to be the most successful to date. A substantial increase occurred in the number of breeders entering flocks and in the number of birds tested. The demand for certified R.O.P. stock and its progeny increased both at home and abroad.

The provincial Record of Performance Breeders' Associations have had an active year and most of them report increased sales of members' stock through the associations. All of these associations now issue annual books or catalogues.

At the World's Poultry Congress, held at Ottawa in August, the display of Record of Performance birds in the live bird section, also in the exhibits put on by the various R.O.P. Breeders' Associations, attracted more attention from the delegates than any other single feature of the Congress. Visitors from over forty countries, having heard of the Record of Performance policy, were eager to learn of its operation and to see the results as exemplified by the birds shown. Perhaps the best proof of the interest created was to be found in the hall containing the exhibits of the R.O.P. Breeders' Associations, where large numbers of birds were shown, resulting in actual orders amounting to well over ten thousand dollars being taken.

Commercial hatcheries are turning more and more to R.O.P. flocks for males to head their breeding flocks, with the result that the general farm flocks of the country are receiving great benefit from the work which the R.O.P. breeders have been doing in breeding for vigor, increased production, egg-weight, breed type and colour, etc. It is in these farm flocks, with their present low production, that R.O.P. will show the greatest economic gain to the industry.

Summary of Results for 1926-1927: Entries were received from 252 breeders for a total of 32,178 birds, an increase of 25 breeders and 5,798 birds over the preceding year. The increase was most noticeable in Ontario and Quebec.

Barneveld. Description of the Barneveld poultry industry. Published by the Mayor of Barneveld in English, French, German, Spanish language, free on request.

Preface:

The purpose of this booklet, is double: In the first place we hope the various illustrations will afford you pleasure, secondly we hope that these photographs may induce you to honour our village with a visit. If you are interested in poultry-farming, nowhere will you have a more favourable opportunity of obtaining a general view of this trade than in Barneveld, one of the most important European poultry-centres. It is here that you will see the results of the efforts of those men, that, by force of willpower and energy have succeeded in developing a breed of chickens of their own which bear the name of our village and have become world-famous. On your visit to Barneveld, you will be able to state that all, members of the Town Council, breeders and traders, are quite willing to give you information and to show you all the interesting sights in the poultry-centre. You will see the hatcheries, among which are some that produce as many as 100,000 chicks in 3 weeks, the large houses for chicken-

breeding, the factories for food and boxes and the numerous poultry-farms. And if you spend a Thursday at Barneveld, you will be astonished to see the enormous bustle in and around our eggmarkethall where annually 30 to 40.000.000 eggs are sold and in the packingsheds from where the eggs are transported to all parts of the world. There too, you will witness the use of a testing machine by which the quality of hundreds of eggs can simultaneously be examined, for we are anxious to deliver good stuff. You can avail yourself of the opportunity of your visit to see our poultry-market which, with an annual turnover of one million animals, may be reckoned among the most important of Holland. Finally, on taking a stroll through our village, you will encounter the statue of our national hero, Jan van Schaffelaar who jumped from the tower in 1482 and by this self-sacrificing deed saved the lives of his comrades. This statue will show you that in the bustle of modern life we do not wish to forget our glorious past. In brief, the purpose of this booklet is to advise you: „Come and see, you are welcome”.

Pedigree Poultry Records. E. W. Callenbach. Bulletin 217. Dec. 1927. The Pennsylvania State College School of Agriculture.

Why should a poultry breeder keep accurate breeding records? Why should records of any kind be kept? Why does a good business man keep a set of books?

The same answer will apply to all of the foregoing questions and may be summed up in a few words: for accurate, useful, available information.

Information may be available but often is not useful. The reason is that should records of any kind be kept? Why does a good business man keep a set it is difficult to understand and interpret. This applies to the poultry business in general and to poultry breeding in particular.

The records used on the poultry plant at The Pennsylvania State College were devised to give a system of record-keeping which would be intelligible to all and yet be complete in every respect.

Pedigree poultry records should answer accurately the following questions concerning an individual fowl:

1. What is the life history of the individual concerned?
2. Which are its ancestors and what is their life history?
3. Which are its brothers and sisters and what is their life history?
4. With what individual or individuals has it been mated?
5. What has been the history of the progeny from the above mating or matings?

A system of records which will answer these questions will enable a poultryman to trace his fowls from generation to generation and within each generation. It will tell him what progress he is making in his breeding work.

It should be stated here that, no matter how accurately or completely records are kept, the time and effort spent on them is wasted unless they are used. In other words, records themselves are of no value. It is what is learned through studying them that is of benefit, that contributes to progress.

Certain Correlations in The Weight and Number of Eggs and The Weight of Fowls, by Horace Atwood. Agricultural Experiment Station. College of Agriculture, West Virginia University. Bulletin 182, August, 1923.

Conclusions:

1. Chickens which received a liberal amount of protein of animal origin while

- young developed more rapidly and began to lay at a younger age than did their sisters whose supply of protein of animal origin was restricted.
2. The younger the pullets when beginning to lay, the smaller were the first eggs laid.
 3. The younger the pullets when beginning to lay, the greater was the percentage increase in the weight of the eggs.
 4. There was no correlation between early maturity in fowls and mean egg weight for the pullet year.
 5. An improperly balanced ration fed to growing chickens increased variability with respect both to the number and mean weight of eggs laid during the pullet year.
 6. The characteristic egg weight of the first few eggs laid by a pullet tended to persist throughout the pullet year.
 7. The data indicated that the heavy layers laid eggs that were at least as heavy as the average for the breed or strain.
 8. Pullets and laying hens were heaviest in the spring.
 9. The maximum egg production was reached in April or May.
 10. Pullet eggs increased in weight from the beginning to the end of the first laying period.
 11. With yearling hens the eggs lightest in weight were laid during the summer months.
 12. The more eggs laid during any particular period, the smaller they tended to become for that period.
 13. With pullets the mean weight of the eggs increased concurrently with the increase in the weight of the birds.

University of Missouri College of Agriculture. Circular 188. Columbia, Missouri. July, 1927.

Culling for Egg Production. H. L. Kempster.

DISEASES

A new international Menace? Pseudo-Fowl-Plague.

From a letter sent by a member in India to the Editor:

„We are very much troubled in India with a new disease. We call it the „Raniklet“ disease, as it was first noted there in August 1927. Birds were sent to our Imperial Veterinary Research Institute for investigation. They could find nothing but succeeded in transmitting the disease from the mouth exudate to pigeons or other fowls. It proved to be a filterable virus and symptoms include gaping, catarrh, foul crop. Death follows in 3 days. It is intensely infectious and has devastated native fowls as well as European birds.

A Dutch veterinary officer from Java visited Lucknow and said they had the same disease there and called it pseudo-plague. (See following summary of the report of Dr. Picard-Java, where about 2 millions of fowls died.) The „Newcastle disease“ in England (T. M. Boyle, The Journ. of Comparativ Pathology and Therapy. Vol. 40 Part. 2 Juni 1927) has semilar symptoms, except that in all our cases subnormal temperatures are noted. Perhaps through the International Association some action could be taken, as the disease is so serious that importation from countries affected would spread the trouble“.

I thought this disease was important enough to publish this letter and the following review of experiments in India at the head of the Disease Section. It is a very clear case of the usefull help which our Review can give to combat international menaces.

Pseudo-Fowl-Pest. Newcastle-Disease (Pseudo-Vogelpest). Dr. W.

K. Picard. Veeartsenijkundige mededeelingen No. 65. Buitenzorg, Java.

At the beginning of 1926 an outbreak of a fowl-disease was reported in some districts of the Isle of Java. This disease was never seen before, had a very epizootic character and spread out quickly over all the isles of the Dutch Indian archipelago. At the same time there were several reports about mortality among ducks, geese, pigeons, turkeys and a lot of wild living birds.

The losses among fowls were very serious. In some flocks mortality was about 100 %. Enquiry was made on more than 400 fowls and on a certain number of ducks, geese and pigeons, affected by this disease.

The symptoms and post-mortem lesions bore many resemblances to fowl pest, but could be differenciated from it by the period of incubation, which is much longer (3-12 d.); by the negative results of inoculations with blood and organs and by the lack of immunity against fowlpest, in birds which survived an infection with the virus of the disease here described. Bacteriological examinations gave always negative results.

Filtration experiments showed that the virus can pass through Chamberland, Berkefeld and Seitz filters.

Spontaneous infection occurs by simple contact, whereas the saliva and droppings are very contagious. Of the inner organs and body fluids only the brains and the yellow fluid in the abdomen of dead laying hen, original from some bursted yolk-follicles, are infectious. On inoculating virulent saliva the author succeeded in contaminating ducks, geese and pigeons.

In connection with the results of the above called experiments, this

disease appears to be a separate entity, which the author proposes to call Pseudo-Fowl plague.

Parasites in the Blood of Geese. Weitere Beobachtungen über das Vorkommen von Leukocytozoën bei der Hausgans. By P. Knuth and W. David. Festschrift Prof. Fröhner gewidmet. Verlag. Ferd. Enke. Stuttgart. 1928. p. 154-160.

The leuco-cyto-zoën do not appear in the same vicinity every year, or in correspondingly great numbers, or by all animals.

Sometimes they are harmless blood parasites while in other cases death is resultant.

The parasites are always in the cellular elements of the blood to be found. The ectoparasites are germ carriers although the manner of transference has not yet been discovered.

Bacillary White Diarrhea and Fowl typhoid. Untersuchungen über Kückenruhr und Hühner-typhus by Prof. R. Manninger (Institut für Seuchen lehre der K. ung. Tierärztlichen Hochschule in Budapest. Zeitschrift für Infektions Krankheiten, parasitaire Krankheiten und Hygiene der Haustiere. Bd. 32, 1928, p. 26.

A complete study resulting in the following conclusions:

Bac. Pullorum and Fowl typhoid, are identical, Bac. gallinarum (klein), Bacillary white diarrhea and Fowl typhoid are therefore but forms of aetiological forms of identical disease.

For the elimination of this disease the Agglutination test has proved successful.

Vergleichende Untersuchungen über Schweine und Geflügelrotlauf-bakterien. Comparative Investigations on Swine and Poultry Erysipelas-Bacilli. By Dr. A. Meyn. Tierseuchen Institut der Universität, Leipzig. Deutsche tierärztliche Wochenschrift. 12 May, 1928, p. 334.

In the last years is represented many times as the fundamental origin of poultry disease, a bacteria which is probably identical with that of swine erysipelas.

By nearly all sorts of poultry can such bacteria be diagnosed as partially sporadic, partially epidemic in appearance.

In the Institute of the University at Leipzig has been diagnosed in the last years eight cases relative to chickens, Guinea fowls, peacocks, pigeons and ducks.

Conclusions: Morphological and tinktorial difference between swine, and poultry erysipelas bacilli, do not exist. Cultural differences cannot be constituted just as biochemic differences. The poultry Erysipelas bacilli are forme mice and rabbits more virulent than swine bacilli.

Through aglutination and immunization tests can be found no difference. Thus both must be considered identical.

Investigations on avian tuberculosis. Studio Sperimentale sulla tubercolina aviaria. Dr. K. Hruska. Staatl. Veterunärinstitut Ivanovice na Hanè (Tschecho Slowakei). Bolletino del IV, Istituto Sieroterapico. Milanese. Fasc. 11 April 1926, p. 109.

Guinea pigs may be infected with avian tuberculosis. Avian tuberculin kills guinea pigs inoculated with avian tuberculosis.

The reagines of avian tuberculin are the only sort capable of killing guinea pigs contaminated with avian tuberculosis.

Guinea pigs innoculated with the human tuberculosis live after an injection of avian tuberculin.

Vaccination against Tuberculosis. Essais de Vaccination des oiseaux contre l'infection tuberculeuse par le BCG du type aviaire. By R. Harnach. Veterinary Institute at Brno. (Tchecho-Slovaquie). Annales de l'Institut Pasteur. April 1928, p. 383.

The vaccin B. C. G. is not tuberculigene.

The bacilli circulate in the body but cannot be found in the eggs.

Rabbits and guinea pigs which are injected with the contents of the eggs have responded to the tuberculine reaction.

The animals were immune through the inoculation against a dose of tubercle bacilli, which kills test animals.

The serum of the inoculated animals is precipitated in vitro by filtrates of tubercle bacilli.

The vaccin B. C. G. gave favourable results against contagion along the intestinal tract, which usually corresponds with the natural contagion.

Combatting Poultry Tuberculosis. Der derzeitige Stand der Bekämpfung der Tuberkulose des Hausgeflügels. By Raebiger. Deutsche tierärztliche Wochenschrift, Bd. 35, n. 48.

In contrast to the cattle, the abdominal organs and the bone marrow are the most infected. The most disease comes in the winter.

Such animals must be slaughtered, and the pasturage and the pens where the animals have walked must remain unoccupied for three months.

Inoculation has had no result. The danger is slight, of tuberculosis being transmitted through eggs which are infected, for the reason chicks hatch seldom out of infected eggs.

Under the domestic animals the pig is the most sensitive, and susceptible to fowl tuberculosis.

And yet the cattle can be spontaneously infected, which leads to abortus.

In the human being the fowl tuberculosis shows indications of septicæmia.

Experiments on Fowl and Mammalian Pocks. By E. Eberbeck. Weitere Untersuchungen über Geflügel und Säugetierpocken. Archiv. für wissenschaftliche und praktische Tierheilkunde. Bd. 57, 1927, p. 217.

On the cornea of a chicken is caused, with fowl pock virus, the typical alternations caused by bird pocks. The cornea is from the virus less sensitive than the surrounding conjunctiva and the skin.

The cornea of the hen proved unreceptive for infection with vaccine virus. The transmission of poultry and pigeon virus upon the skin of a rabbit was a failure.

Immunisation Experiments with Birds. By L. Detre. *Immunisierungs Verhältnisse bei Vögeln.* Centralblatt für Bakteriologie, Parasitenkunde und Infektions Krankheiten Abt. 1, Orig. 1926, S. 174.

The immunity reactions begin in pigeons and chickens more quickly than with mammals but it is of shorter duration.

The writer attributes this to the fact that the optimum of immunisation reactions lay, not at 37 % but between 43 % and 44 %.

The lack of an incubation time from the appearance of haemagglutinins proves that the production of anti-bodies appears immediately after the injection in bodies of strange albumins.

Vaccination against fowl-cholera. Die Impfungen gegen die Geflügelcholera. Mitteilungen des Bacteriologischen- und Serum-Instituts zu Landsberg, April 1928. Landsberg-Warthe.

It is impossible to get a good immunisation by injecting killed bacilli. Therefore investigations were made with living, avirulent cultures and good results are obtained.

* *Parasites of Fowl. Wichtige parasitäre Krankheiten des Geflügels.* Dr. W. David. Tierärztliche Rundschau, 1928, p. 335.

Description of coccidiosis and trichomoniasis (blackhead), *Prosthogonimus* in the Bursa Fabricii, tape-worms and Trichosomiasis.

* *An Epidemiological Study of Blackhead in Turkeys.* Storrs Agricultural Experiment Station. Storrs, Connecticut. Bulletin 148. December, 1927.

The work at the Storrs Station has shown that turkeys can be reared in successive years in close confinement without serious losses from blackhead, by the rotation system described in this bulletin. This saving from blackhead may be due to a break in the cycle of development of a protozoal organism which may be the cause of this disease, or, what is more probable, to a partial cleansing of the ground during the intervals of rest, and restoration of grass and clover to the yards, and hence an ample supply of this growing green food.

Whether the same results may be obtained by the use of only two rotation yards and a system of bi-weekly rotation, instead of weekly, has not been determined. Such a modification would be in the direction of added simplicity, but numerous experiments are necessary before it can be adopted without material risk.

There can be little doubt that chickens and other barnyard fowl transmit blackhead disease, and that ground that has been and is occupied by them constitutes an immediate source of infection.

In setting out to rear turkeys on any scale whatsoever, it is extremely

important to select ground which has not been exposed to turkeys, chickens, etc., and even cattle and horses. If no such ground is immediately available, the most promising site should be selected, completely enclosed by high wire fencing, and allowed to rest for at least six months, after thorough cultivation and sowing in grass and clover.

In carrying out the rotation system, no pains should be spared to protect the young poults and growing turkeys as much as possible from contamination from without. The care and feeding are also important factors, and last, but not least, strong virile stock should be selected as birds for breeding.

The Occurrence of Chondro dystrophy in chick Embryos. Untersuchungen über Chondro dystrophie. By Walter Landauer. Storrs Agric. Exp. Stat. Storrs, Conn. mit 60 Textabbildungen. Wilhelm Roux' Archiv für Entwicklungsmechanik der Organismen. Julius Springer, Berlin 1927. 110 Bd., 2 Heft.

I. General Symptoms and Skeleton of Chick Embryos.

II. The Genetic Evidence by L. Dunn.

Summary: For the first time in birds, **chondrodystrophia foetalis** has been observed in chicken embryos. The malformation, at least when present in a recognizable degree, is always lethal. It is independent of sex and has appeared in different strains and varieties of fowl.

The specific expressions of the chondrodystrophic condition are limited to the skeleton. Very striking changes in the cartilage formation and the rate of perichondral ossification represent the typical features of chondrodystrophy. Externally the chondrodystrophic embryos are characterized by a shortening of the legs, varying in degree, by curvatures of the long bones and by a shortening of the base of the skull. The vault of the skull is pushed forward and the protruding upper beak bends downwards as in parrots. Various degrees of these characters lead from the most typical cases to an almost normal external conformation.

The histological study of embryos near hatching time revealed a resemblance to the situation in chondrodystrophic mammals in the following principal points:

1. The epiphysis of the long bones of the legs are frequently considerably broadened and of mushroom-like appearance (the diaphyses are funnel-shaped).
2. The cartilage of the epiphyses is softer than normal.
3. The perichondrium is thickened.
4. The arrangement of the cartilage cells is irregular throughout the entire epiphyses.
5. The cells of zone I usually are smaller than normal and farther apart. In certain cases, however, the cells are contiguous and flatten each other.
6. Zone II of the epiphyses always shows the most marked changes. Frequently the zone is missing altogether. If the zone is present, one never finds in it the normal columnar arrangement of the cells. Usually the cells do not show the discoidal appearance, typical for this area, but are more ovoid.
7. The amount of cartilage matrix may be much increased or the matrix may be missing completely or almost completely.
8. The epiphyses usually are well vascularized and contain many marrow cavities. The surrounding cartilage cells take the course of the vessels and cavities in an unusual manner.
9. Coming from the limit between epiphysis and diaphysis, periosteal connective tissue frequently invades the epiphysis. This connective tissue (with

very rare exceptions in our material) enters the epiphysis on the mesial side of the bones. At first, it follows approximately the long axis of the bones and then in the area of zone II or in the posterior part of zone I turns toward the center of the epiphysis. Sometimes the connective tissue spreads out in a plate-like form. Finally it disappears between the cartilage cells. It contains blood vessels and sometimes includes cartilage cells.

10. The centres of ossification in the epiphyses sometimes appear earlier than normally. For our material this is true for the proximal epiphysis of the metatarsus.
11. The greatest changes are found in those epiphyses which during normal development show the most intensive growth.
12. The diaphyses are short, thick and hard. The perichondral ossification is increased, the endochondral ossification (normally not far advanced in the chicken embryo) is arrested. The bone trabeculae of the diaphyses are broader than normal.
13. Extending across the end of the diaphysis, one frequently finds an unusual bone formation, which follows the course of the invading connective tissue. Towards the epiphysis the edge of this bone is irregular and serrated.
14. The diaphys frequently are bent toward the body. At these places osteophytic perichondral ossification extends across the entire diaphysis and the bone trabeculae follow the altered lines of stress (functional structures).
15. The marrow cavity of the diaphysis usually is smaller than normal and frequently is interrupted at the places where the bones are bent. The marrow cavities contain an increased number of marrow cells. A conspicuous alveolar connective tissue frequently fills the space between the marrow cells. Osteoclasts are very few in number or missing entirely.
16. The base of the skull frequently shows a complete synostosis of the basi-occipital and basi-sphenoid; the same is true for the occipital bones surrounding the foramen magnum. The basi-occipital and basi-sphenoid, usually arranged in an almost straight line, form a sharp angle with each other. This is caused by a more erect position of the basi-occipital.
17. The ossification of the vertebrae is advanced and the parts constituting them are thickened.
18. The foramen magnum and the medullary canal are narrowed in dorso-ventral direction.
19. The ribs usually are broader than normal.
20. The pelvis shows a very advanced ossification and is considerable flatter than normal.

In the following points our material deviates from what has been reported for mammals:

1. The rosary-like malformation of the ribs, frequently though not regularly observed in mammals, was not found.
2. The pelvis is broader than normal (although considering the almost completed ossification, one may call it potentially narrower).
3. The anterior extremities are normal in all advanced stages of embryonic development, even if all the other characteristics of typical chondrodystrophy are present.

The study of young chondrodystrophic embryos added the following results:

1. The epiphyses of the long bones of the legs show a marked enlargement and a mushroom-like appearance more frequently than in older embryos.
2. In no case did the youngest embryos which we observed (beginning of the second week of incubation) have an invasion of periosteal connective tissue into the epiphyses. Later on (end of second week of incubation)

changes in the structures of the zone II of the epiphyses make their appearance, apparently proceeding the ingrowth of connective tissue.

3. The diaphyses are much more bent in the young embryos.
4. The skull regularly shows the typical chondrodystrophic conformation. The growth of cartilage at the base of the skull had apparently ceased before a synchondrosis took place.
5. The connective tissue bones of the skull are also involved in the pathological processes producing chondrodystrophy.
6. In early stages of embryonic development the wings mostly are considerably shorter than normal and at least in certain cases the bones of the wings morphologically and histologically show the changes typical for chondrodystrophy.

We conclude from our observations that connective tissue only invades the epiphyses after degenerative processes have taken place in the epiphyseal cartilage. We assume with Schmidt and Dietrich that this connective tissue is derived from the marrow cavities of the epiphyses and we agree with Dietrich in his conclusion that is most probably has a compensatory function. Our observations furthermore force us to believe that the invasion of connective tissue in no way is responsible for the curvatures of the diaphyses. These curvatures, as a consequence of the abnormal softness of the cartilage, must be completed before ossification begins and before the connective tissue enters the epiphyses.

The study of the trajectorial bone structures at the places of bending of the diaphyses showed that the changes in these structures always correspond exactly to the course of the lines of stress. The new structure is **directly** laid down during ossification. This demonstrates that there is during embryonic development a complete and immediate adaptability of the ossification to new functional stress. These observations, of course, disprove the assumption that the ontogenetic appearance of the structure of the bones is determined phylogenetically and it forces us to the conclusion that the formation of the normal structure of the bones is caused only by the static conditions of the muscle tonus during embryogeny.

Sod Disease of Chickens (Vesicular Dermatitis). By I. E. Newsom and W. H. Feldman. Synonyms—Foot and Head Disease—Foot and Head Blister. Colorado Agricultural College. Fort Collins, Colorado.

Since this disease has never been previously described in any literature to which the authors have access, they find it necessary to select a name for it. There is no name in common use even among those who suffer from its effects. They have been wont to speak of it as foot and head disease but since their observations seem to indicate that it is also associated with virgin sod, they have selected the name which appears at the head of the pamphlet. The term "Vesicular Dermatitis" is used technically because of the inflammatory condition of the skin of the face and feet, which is so frequently associated with the formation of blisters.

Description of history, cause etc. of this disease.

✧ *Common Parasitic Worms of Poultry.* A. J. Durant. University of Missouri College of Agriculture. Circular 187. Columbia, Missouri. May, 1927. Description of Round Worms, Tape Worms and Treatment.

Mitteilungen des Bakteriologischen und Serum-Instituts zu Landsberg A. W. Landsberg-Warthe, April 1928.

Diseases of Poultry: In 1927 are examined the following birds: hens and chickens 505, geese 73, ducks 32, turkeys 61, pigeons 26, other birds 7, totally 703. They were suffering from:

Cholera 68, tuberculosis 67, colibacillosis 64, para-typhoid 13, Bac. gallinarum 7, streptococci 13, aspergillosis 23, Bac. pullorum 7, diphtheria 33, coryza contagiosa 28, leucaemia 39, coccidiosis 52, inflammation of the oviduct 30, poisons 53, gout 14, other diseases 14, worms of the stomach in geese 35, worms of the stomach in ducks 7, other worm-infections 39.

From these figures results that cholera and tuberculosis are at the top. Diphtheria, leucaemia were increasing.

Against cholera good results were obtained by a new method of vaccination by living, avirulent cultures of cholera-bacilli.

Virus Diseases of Fowls as exemplified by contagious Ephithelioma (Fowl Pox) of Chickens and Pigeons. (3 plates) by E. W. Goodpasture. Professor of Pathology, Vanderbilt School of Medicine, Nashville. page 236. Filterable Viruses, edited by Th. M. Rivers, Baltimore. The Williams and Wilkins Cy. 1928.

Contains: Introduction, Epidemiology, The spontaneous Disease, Distribution of the Virus in the Infected Animal, The inoculated Disease, Pathological Anatomy, The Virus, The relation of Epithelioma Contagiosum to avian diphtheria, Immunity. The relation of Epithelioma Contagiosum to mammalian Pox, Theoretical considerations, Relation of Epithelioma Contagiosum to molluscum Contagiosum, Bibliography.

The Control of Roup and its Effect upon Egg Production. The Agricultural Experiment Station. North Carolina State College of Agriculture. Raleigh.

In a study of the results of the second year when a virulent outbreak of roup attacked the flock there are two outstanding points to observe:

First, if quick and proper steps be taken, roup can be eradicated from the flock.

Second, during the two or three months that roup attacks the flock there will be considerable slump in production. This slump will not be made up later in the year but causes a total loss.

It is also noticed from the tabulation that the consumption of mash fell off perceptibly during the months of January and February or during the attack of roup. The total average consumption of feed per hen per day for the year was 3.6 ounces during the normal year and 3.64 ounces during the year of attack by roup. The annual production was 47.7 per cent during the normal year and 39.4 per cent during the year of attack by roup.

In the matter of production there is noted a reduction in the second year in December, January and February. This is due to the disease attacking the flock during the latter part of December. The balance of the year shows results as one would expect in two parallel flocks of the same breeding.

The Immunization of Fowls against Chicken-Pox (Epithelioma Contagiosum) by Subcutaneous Injection of Virus. J. R. Beach.

Hilgardia. A Journal of Agricultural Science. Published by the California Agricultural Experiment Station. December 1927. Vol. 3, No. 3.

This paper presents the results of studies in the immunization of fowls against chicken-pox by the subcutaneous injection of vaccine prepared by mixing finely ground fresh tissue obtained from cockerels with pronounced comb infection of chicken-pox with a suitable liquid diluent. In these studies approximately one thousand birds that were kept under laboratory conditions and fourteen thousand birds on poultry farms have been utilized.

In the preparation of vaccine, the entire comb, or the lesion and sub-lesion epithelial tissue, either alone or with the addition of the liver, spleen, kidneys, and blood, was used. The lesion and sub-lesion epithelial tissue, alone, however, appeared to be the more satisfactory. As a diluent or vehicle and preservative for the tissue, either 0.5-percent phenolized physiologic salt solution or a mixture of equal parts of glycerine and 1.0-percent phenolized physiologic salt solution was used. The latter seemed to be preferable. The conclusions which follow are based upon the results of experiments with vaccines prepared from lesions and sub-lesion epithelia tissue and a mixture of equal parts of glycerine and 1.0-percent phenolized physiologic saline.

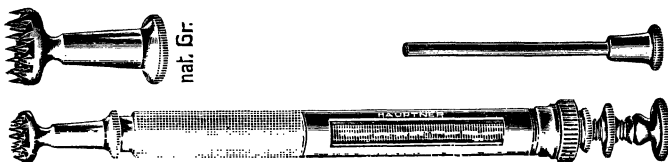
Such vaccine is capable of producing in fowls within 28 days after administration either complete immunity or a high degree of resistance to artificial infection with chicken-pox virus. The immunity of resistance has been shown to last for at least as long as 275 days. The data, however, are insufficient to permit conclusions regarding the percentage of vaccinated fowls that will remain completely immunized for such a long period after vaccination.

The subcutaneous injection of vaccine containing an abundance of virulent virus is usually followed by the development of a chicken-pox lesion at the point of injection. Such lesions do not spread to other parts of the body nor otherwise become harmful. When vaccine that is not more than 30 days old is used, vaccination-point lesions will be produced on nearly all of the fowls.

Although the data obtained in these experiments are not sufficient to prove definitely that when young fowls are vaccinated during the summer and fall they will be protected against chicken-pox infection during the following winter and spring, they nevertheless suggest that such may be the case.

Vaccination against Diphtheria. Ein neues Instrument zur kutanen Schutzimpfung gegen Hühnerpocken und Hühnerdiphtherie. A new instrument (syringe-trephine) for prophylactic cutaneous immunization against chicken-pox and chicken-diphtheria. By Dr. O. Seifried, Berliner Tierärztliche Wochenschrift, 1928. Nr. 18, S. 296

The Vaccino-Trephine by de Blicq and van Heelsbergen for the cutaneous immunisation against chicken-pox and -diphtheria (rub of the vaccine into



skin of the leg, which has been freed of the feathers) is to be dipped several times into the vaccine-emulsion. This takes time

and is profuse because the emulsion drops off and is lost. Besides that the quantity of the used material cannot be known exactly by use of this. The small rub-end and the thin smooth shaft of the Trepine is also not comfortable to be kept especially during the vaccination of a large flock.

These disadvantages are eliminated by the „syringe-trepine“. The advantage of this instrument is the direct connection of the rub-plate (a), which bears 12 short teeth with a syringe (b) keeping the vaccine.

There is a small tube to suck up vaccine; this tube is to be screwed on the syringe. The use of this instrument is economical and the dosis can be made very exact because the syringe is a drop-syringe (1-2 drops for one animal are enough). The syringe-trepine is made for 2 and for 5cc and is especially comfortable for the vaccination of large flocks.

When several flocks are to be vaccinated two rub-plates or better two syringe-trephines are to be used, to avoid the infection of the sound animals.

Bacteriophage Experiments. by Ronald Gwatkin. Report of the Ontario Veterinary College 1927. Toronto 1928.

1. Attempts to increase the virulence of six races of Pullora-bacteriophage were unsuccessful. Several strains of *S. pullora* were employed. Failure may have been due to the use of unsuitable bacterial strains. Two of them were found to be mixed cultures (bacteria + bacteriophage).
2. Examination of one of the lysed bacterial controls of *S. pullora* showed the presence of regular and atypical colonies. The bacteria in the latter were coccus-like. They were not agglutinated by specific serum. They gave the same carbohydrate reactions as the regular colonies. Growth was heavier than the regular type but later both appeared alike.
3. Mixed cultures were encountered in three instances, apart from the two already referred to. Attention was drawn to them by the fact that growth was poorest where the blood or pus was thickest on the plates. Subsequent cultures showed the presence of the bacteriophage. This suggests the possibility that failure to isolate *S. pullora* from some dead chicks in outbreaks of bacillary white diarrhea may be due to the action of the bacteriophage.

Avian Tuberculosis by L. van Es and A. F. Schalk. North. Dakota Agricultural Experiment Station. Bulletin No. 108.

Contents: Historic Consideration, Geographic Distribution, Economic Importance, Etiology, Modes of Transmission, Lesions, Symptoms, Diagnosis Prognosis, Prophylaxis, Relation of Avian to Mammalian Tuberculosis, Bibliography (291 numbers. Illustrated with 3 instructive coloured plates of:

- I. Tuberculosis of Intestine and Peritoneum.
- II. Tuberculosis of Liver and Spleen.
- III. Head of chicken showing positive tuberculin reaction of comb and right wattle.

A sensitization method of differentiating avian from mammalian tubercle bacilli by A. B. Crawford. Amer. Rev. of tuberculosis, 15. 111-126, 1927.

Avian tuberculosis in Hogs. Das Vorkommen von Geflügeltuberkulose beim Schwein by Dr. K. Hruska. Ivanovice na Hané Tschechoslowakei. Archiv für wissenschaftliche und praktische Tierheilkunde. Bd. 57, 1928, p. 514 and by R. Helm, ibid. p. 515.

Bac. gallinarum in young ducks. Ein Fall von Hühnertyphus bei jungen Enten. Deutsche tierärztliche Wochenschrift, 1928, pag. 121 by Dr. Ruth Eber. Institute for Animal Pathology, Leipzig.

Csontos published a case in Ungary where turkeys and ducks died from infection with *Bac. gallinarum*. In Leipzig *Bac. gallinarum* was detected in baby chicks and ducklings which were incubated in one incubator. They were reared in the same house but separated by wire-netting. The cultures from the ducklings give positive agglutination reactions with *Bac. gallinarum*, *Bac. pullorum* and *Bac. typh. Gärtneri*.

Author thinks the name: Hühner-typhus (hen-typhoid) must be changed in Geflügel-typhus (Poultry-typhoid), while this disease is affecting as well turkeys, pheasants, peacocks and ducks.

Combating Bacillary White Diarrhea. Die bakterielle Kückenruhr und ihre Bekämpfung by Dr. F. Schmidt, Hoensdorf. Laboratorium for poultry-diseases of the bacteriological Institut at Halle a. d. Saale. Archiv. für Wissenschaftliche und praktische Tierheilkunde. Bd. 56 p. 313. Bd. 57, 1928, p. 472.

Experiments with agglutination and precipitation.

Precipitation with albumen from the eggs gave good results.

Salmonella pullora Studies. A comparison of the Agglutination and pullorin Tests for the detection of carriers of *S. pullora*. Ronald Gwatkin. Report of the Ontario Veterinary College 1927. Toronto 1928.

The agglutination test was more satisfactory than the pullorin test as employed in the two flocks in which a comparison might fairly be made.

Examination of cultures from chicks and adult Birds.

Cultures from 134 outbreaks of B.W.D. were shown to be *S. pullora*. Twenty strains did not form gas with the medium and method of incubation employed. Two of seven strains from adult infections did not form gas. Maltose in ox serum-water was not split by any of the 144 strains of *S. pullora* examined.

Comparison of the rapid and twenty-four-hour methods of agglutination.

The rapid and regular tests were not in agreement in a number of instances.

Some Experiments on the Desinfection of Eggs and Incubators by Ronald Gwatkin. Report of the Ontario Veterinary College 1927/28 Toronto 1928. Description of a new method to disinfect eggs and incubators with formaldehyd during the hatching-process without doing harm to the embryos.

Summary: Whole eggs were not found to be satisfactory for experiments in dipping.

Pasteurella avicida on egg shell was not destroyed by immersion in 95 per cent. methyl hydrate for twenty minutes.

Salmonella pullora on egg shell resisted the action of 95 per cent. methyl hydrate for from five to fifty-five minutes. In no case, however, was the organism destroyed by the few seconds dipping ordinarily employed. The irregular results observed with the same culture did not appear to be due to the strength of the infecting suspension. The same organism resisted dipping in freshly made solution of chloride of lime, of a strength of about one pound to fifty gallons of water.

Pasteurella avicida resisted drying in the dark at room temperature for the fourteen days it was tested.

Salmonella pullora resisted drying on shell in the dark at 37° C. for twelve days, after which time no growth occurred. Infected pieces of shell stored in the dark at room temperature gave growth up to forty-four days, at which time the supply of shell gave out.

An incubator, four feet seven inches by four feet two inches by eleven and one-half inches, containing eggs, was satisfactorily disinfected with formaldehyde on one occasion six, and on another eight times, during hatching, without doing any apparent harm to the hatch. Thirty cubic centimeters of formalin and ten grammes of potassium permanganate were used to generate the gas. Disinfection was checked by exposing pieces of infected shell in the incubator. It was found necessary to seal the doors to prevent escape of gas.

The Importance of the Dilution Factor in the Agglutination Test for Bacillary White Diarrhoea. Ronald Gwatkin, Ontario Veterinary College, Guelph, Ont., Canada, 1927.

Summary: In the foregoing comparisons in which three or more dilutions were employed, the 1-50 dilution picked two hundred and seventy-four out of two hundred and eighty-four samples with which any agglutination occurred. Nine of the other ten samples showed agglutination in 1-10 only, and examination of the ovaries of three of these birds proved negative for *S. pullora*. The tenth sample, which was hemolysed, showed agglutination in 1-200 only.

In the comparison of one hundred and ninety-one positive samples in dilutions of 1-50 and 1-100, the former dilution picked nine more than the latter; while one more of the one hundred and forty-two hemolysed samples was picked by the 1-200 than the 1-50 dilution. Either of these dilutions alone would have missed twelve or thirteen positives.

With the antigen employed, the critical dilution appeared to be 1-50. No agglutination occurred in this dilution with normal sera and the pro-agglutinative tendency of fresh sera was not sufficient to prevent agglutination occurring in this tube. The phenomenon of pro-agglutination did occur in hemolysed sera, which for the reasons already stated should not be tested. It was considered that if only good sera were tested, and any degree of agglutination in 1-50 was regarded as positive, the results would closely parallel those of the more elaborate test. This dilution was adopted by us for use in the single tube test, which has been applied to about thirty thousand sera, with results which appear to be as satisfactory as those obtained with the two and three dilutions previously used.

The ovaries of five out of one hundred and two reacting birds were negative *S. pullora*. The sera of four gave a well marked reaction, but that of the fifth was within the normal agglutinative titre.

Indications are that the interagglutinability of *S. pullora* and *E. sanguinaria* would not detract from the value of the practical application of the test.

The highest dilution in which complete agglutination was encountered was 1:1600.

A rapid microscopic agglutination test with undiluted serum did not prove to be of value.

In conclusion, this paper will have fulfilled its purpose if it has in any way emphasized the importance of, and stimulated interest in the dilution factor. Much comparative work is necessary in connection with this, and other factors having a bearing upon the test, in order that a satisfactory dilution or series of dilutions could be definitely established in which agglutination would be accepted as indicating infection. A step towards this would be the adoption by those engaged in comparative work of an antigen that was standardized as to strains, methods of preparation and density.

*Supporting Bacillary White Diarrhoea Research Project of the
Federal Department of Agriculture. Washington, U.S.A.*

Resolution 6. Whereas: **The National Poultry Council**, representing all phases and kinds of activity which are concerned in and related to the poultry industry of America, was instrumental in collecting \$ 15,000.—, and some months ago turned this money over to the **Bureau of Animal Industry of the United States Department of Agriculture** for the sole and exclusive purpose of having that agency and its co-workers in research thoroughly investigate bacillary white diarrhoea in fowls, and

Whereas: The National Poultry Council further agreed to use its utmost endeavor in securing such further appropriations of money either from Congress or from other sources as would enable our Bureau of Animal Industry to carry forward to completion without any unnecessary delay this comprehensive research upon bacillary white diarrhoea.

Now therefore be it resolved: The National Poultry Council in its convention in the Hotel Sherman at Chicago, Illinois, realizing the tremendous injury which may be done to the poultry industry of America through illy advised and insufficiently considered action, requests all agencies having to do with poultry, and most particularly regulatory bodies, to promulgate no orders or quarantines which have to do with this disease until the Bureau of Animal Industry of our Federal Department of Agriculture shall have completed its research and have made its recommendation based upon its findings of facts.

*To study Bacillary White Diarrhea. Reliable Poultry Journal
Febr. 1928.*

It has been announced in these columns that research work was begun sometime ago by the U. S. Department of Agriculture under the direction of Dr. J. R. Mohler, chief of the Bureau of Animal Industry. Buildings have been constructed at the government poultry farm at Beltsville, Maryland, and other buildings remodeled at Bethesda, Maryland. Equipment of brooders, incubators, and laboratory facilities have been provided, also a flock of hens that are known to be „reactors”.

Now comes the announcement that the subject of Bacillary White Diarrhea is to be investigated by the Ohio State University, the Kansas State Agricultural College, and commercial incubator manufacturing companies.

Professor E. L. Dakan, head of the department of poultry husbandry of Ohio State University called a meeting at Washington. Those attending were Dr. Mohler, Dr. M. A. Jull, in charge of poultry work for the U. S. Department of Agriculture. Dr. M. Dorset, chief of the Biochemic division of the Bureau of Animal Industry of the United States Department of Agriculture. Dr. Hubert Bunyea, poultry disease investigator of the Department of Agriculture; Professor Dakan, Professor L. F. Payne, head of the department of poultry husbandry, Kansas State Agricultural College; and George Cugley of the Buckeye Incubator Company, Springfield, Ohio.

The work at the Ohio State University will be carried on by Dr. Fred Speer of the bacteriology department, under the general direction of Professor

Dakan, and in close cooperation with Dr. Charles Bradfield Morrey, head of the department of bacteriology and nationally known authority in this field.

Ohio's share in this work will be to investigate the effects of various methods of brooding on the spread of bacillary white diarrhea. Ohio will also work on the use of gasses in disinfecting the incubator room and incubators.

The major project of Kansas State Agricultural College will deal with disinfection of incubators, both methods and materials. This is to be a thorough and far-reaching study under the direction of Dr. L. D. Bushnell, head of the department of bacteriology, in co-operation with Professor Payne.

All three institutions expect to do considerable work on the so-called pullorin or wattle test for bacillary white diarrhea. Professor Dakan is quoted as stating that he does not believe the blood test will ever be applicable to the hatchery industry, because of its expense, the short period during which the test can be administered and the lack of trained technicians to do the work.

This research work is made possible by the gifts of incubator manufacturers, mainly the Buckeye Incubator Company of Springfield, Ohio, and the Smith Incubator Company of Cleveland, Ohio. About \$15,000 has been given to the federal government at Washington and between \$5,000 and \$6,000 will be expended at the Ohio State University at Columbus, and an equal amount at the Kansas State Agricultural College at Manhattan.

Will We Lick B. W. D. Poultry Tribune, Febr. 1928.

State and federal, private and commercial interests have united to study Bacillary White Diarrhea. Will we win? Should we succeed in most thoroughly uncovering the fundamentals, control of the disease will be as simple as that of many other diseases such as hog cholera, for instance, which has been mastered.

Yes, we have every reason to believe that the battle will be won by the investigators. We are all the more sure of our belief because a recent report from the United States Department of Agriculture informs us that Dr. M. Dorset, Chief of the Biochemic Division of the Bureau of Animal Industry of the United States Department of Agriculture, who won world wide fame as the leader and discoverer of hog cholera serum and virus inoculation, will head up this newly launched objective against bacillary white diarrhea of chicks, and will give his full time to it.

The research work is made possible by gifts from several incubator companies, mainly the Buckeye Incubator Company of Springfield, Ohio and the Smith Incubator Company of Cleveland, Ohio. About \$15,000 a year has been given the federal government at Washington, between \$5,000 and \$6,000 will be expended at Ohio State University, and an equal amount at the Kansas institution at Manhattan.

The government work will be conducted at its poultry farm at Beltsville, Md., and at the animal disease farm at Bethesda, Md. A flock of 300 hens known to be reactors to the disease has been assembled. Equipment of brooders, incubators and laboratory facilities has already been provided.

Interested in the work are Dr. M. A. Mohler, chief of the Bureau of Animal Industry, Dr. M. A. Jull, in charge of poultry work, Dr. M. Dorset, Dr. Hubert Bunyea, poultry disease investigator, Prof. E. L. Dakan, Ohio State University, Prof. L. F. Payne, Kansas State Agricultural College, George Cugley, president of the Buckeye Incubator Company, Dr. S. B. Smith of the Smith Incubator Company and many other private individuals.

No stone will be left unturned in attempting to discover the cause of disease, the source of its infection, the spread of the disease and the amount or damage done.

Whether the blood test will be used as a method of diagnosis after the investigators have completed their work, we cannot say. Be that as it may, we are sure that B. W. D., or Bacillary White Diarrhea, will be licked in this battle.

Resistance to Bacillary White Diarrhea by L. E. Card and E. Roberts. University of Illinois. Poultry Tribune.

1. Great variation exists among chickens with respect to their resistance to infection with *S. pullora*, the causative organism of bacillary white diarrhea.
2. The occurrence of resistant chicks is such as to indicate a natural resistance that is hereditary.
3. Chicks from certain hens are much more resistant to infection than are the chicks of other hens.
4. The occurrence of resistance is sufficiently consistent among chicks from certain hens and flocks to suggest that it may be possible to establish a strain of fowls that will be highly resistant to bacillary white diarrhea.

Bacillary White Diarrhea by B. F. Kaupp and R. S. Dearstyne. Technical Bulletin no. 29, June 1927. North. Carolina State College of Agriculture Raleigh. N.C.

Summary:

1. Bacillary white diarrhea probably is present wherever poultry husbandry is practised. The infection has been found in 71 of the 100 countries of North Carolina. The disease is highly contagious and is productive of great monetary loss to the poultrymen of the State.
2. The disease produces a septicemic condition in chicks, resulting in a pathological condition of the internal organs. The lesions produced are fairly constant, and are typical of the disease.
3. The disease may assume a virulent form in adults. The clinical history of infected adults shows slight deviations in respiration, elevation in temperature, a leucocytosis in the blood, and is not usually fatal.
4. Studies of the carrier bird show that the focalized condition of the disease does not noticeably affect the respiration; there may be temporary elevation of temperature; the annual body weight curve follows that of normal birds; there is a distinct tendency to nest more often than the normal bird, and that the death rate in carrier birds is abnormally high.
5. The per cent of infected eggs laid by carrier birds was found to be 7.31 in 1,313 eggs examined from the heavy breeds, and 5.23 per cent of 2,505 eggs laid by Leghorns. The total per cent of infected eggs ran 5.94 in 3,818 eggs examined. The per cent egg infection rises as production increases, and reaches its greatest height at the season of maximum production.
6. Carrier birds may be profitable from an egg production standpoint during the pullet year.
7. The blood of the carrier bird shows a mild leucocytosis of the polymorphonuclear variety.
8. Mortality from *S. pullora* infection commences in the shell. Forty-eight of 175 chicks, or 27.4 per cent of total number of chicks dead in the shell on 21st day of incubation of eggs from carrier birds revealed infection with *S. pullora*. In comparison with this figure, only 4 or .004 per cent or 1,000 chicks dead in the shell on the 21st day of incubation in hatcheries using only eggs from blood-tested stock, showed the presence of this organism.
9. In flocks of reactors studied, the agglutination test would remove 90 per cent of the carriers if applied at any time in one flock of 29 reacting birds held 14 months; it would have removed 98 per cent of the carriers in an infected flock of 21 birds studied for 6 months, if applied at any time, and would have removed 98 per cent of the carriers of avian typhoid

- in a flock of 50 birds studied 6 months, if applied at any time during that period.
10. The intermittent results obtained on application of the agglutination test to carrier birds in some instances is established. These investigations bring out the fact that the intermittent reactor delivers infected eggs during continuous months of negative reactions, and probably never recovers from the disease.
 11. Post mortem examinations confirm the positive agglutination test by pathological lesions in 92.9 per cent of 362 hens, and in 69.6 of 135 pullets. The ovaries are the principal site of focalization of the disease in birds of both classes. In hens, the heart structure showed alterations in 14.7 per cent, while involvement of this organ was found in 25.5 per cent of the pullets.
The cousative organism was isolated from 70.3 per cent of the hens, and 57.4 per cent of the pullets. The heart structure of 2 of 5 males examined showed the presence of the organism.
 12. The rate of infection among the domestic fowl of North Carolina is higher in the heavy breeds than in the light breeds.

Bacillary White Diarrhoea of Chicks by I. E. Newson. Colorado Experiment Station. Fort Collins Bulletin no. 293. Dec. 1927.

Fowl Typhoid. A study of the pathogenic and antigenic Properties of Eberthella Gallinara (Klein) — E. Sanquinaria (Moore) by C. C. Palmer and H. R. Baker. Bulletin no. 153. Jan. 1928. University of Delaware. Agricultural Exp. Station Newark, Delaware.

Conclusions:

1. *E. gallinara* (Klein) shows considerable variation in virulence.
 2. From six natural outbreaks of fowl typhoid on Delaware farms, five virulent strains, and one avirulent strain of *E. gallinara* (Klein) were found when six test birds were employed in testing the virulence of the organism.
 3. The virulent strains when first isolated killed 16.6 to 33.3 percent of the test fowls.
 4. Artificial inoculation studies reveal that 60 to 70 percent of fowls are naturally immune to fowl typhoid.
 5. The virulence of *E. gallina* (Klein) is soon lost when the organism is maintained upon artificial media.
 6. Three subcutaneous inoculations with living avirulent strains (vaccine) reduced the number of deaths in the vaccinated birds to one-third of those occurring in the non-vaccinated birds, when all birds were subsequently inoculated intraperitoneally with virulent cultures.
 7. Experimental evidence points to the conclusion that vaccination against fowl typhoid may be regarded as a procedure of considerable economic value.
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NUTRITION

A Balanced and An Unbalanced Ration Fed Prior to the Hatching Season As Affecting the Hatchability of Eggs and the Vigor of the Progency by Horace Atwood. Agricultural Experiment Station. College of Agriculture, West Virginia University. Bulletin 207, July, 1927.

Conclusion: This experiment affords no evidence tending to show that a reasonably heavy egg production immediately prior to the hatching season has a detrimental influence on the fertility or hatchability of the eggs or on the vigor of the progeny.

Feeding for commercial Egg-Production by O. G. Krum. Colorado Agr. College. Fort Collins, Colorado.

Contents: Principles of feeding hens, the chemical needs of the laying hen, balancing the ration, vitamins in feeding, feeding practices, colorado feeding schedule.

Waste Pimiento Pepper for Coloring Egg Yolks. W. A. Morgan and J. G. Woodroof. Bulletin no. 147, July 1927.

Summary and Conclusions: The fact that dried, ripe Pimiento pepper can be used for coloring the yolks of eggs during the winter months when fed to hens in quantities of from 0.4 to 0.5 grams per hen each day will be of interest to poultrymen and pepper growers. The production of sufficient quantities of pepper is not a problem because many tons of material suitable for this purpose are now being wasted each year.

Dried, ripe Pimiento pepper containing about 16 per cent water can be used in hen feed to impart a desirable color to egg yolks at times when the yolks are lacking in color. The optimum amount was found to be 0.5 gram per hen each day. The best method of feeding the dried, Pimiento pepper was to first grind it with wheat shorts or similar feed and then mix with the proper amount of mash.

The dried pepper may be added to any other laying mash the poultryman may be using. He can of course vary the amount added according to whether his market demands a very light, medium or dark colored egg yolk.

It is understood, of course, that the laying mash containing the pepper should be fed in conjunction with scratch grain feeds just as other mashes are fed.

The Effect of Various Sources of Animal Protein on the Egg Production and Condition of Single Comb White Leghorn Pullets. P. T. Kistler, T. B. Charles and H. C. Knandel. Bulletin no. 206, Sept. 1926. The Pennsylvania State College. School of Agriculture.

The object of The Pennsylvania State College experiments described in

this bulletin was to determine the effect of various sources of animal protein on the production, health, molt, and general physical condition of Single Comb White Leghorn pullets. Due to the fact that a disease epidemic caused a heavy mortality during the second year, the results of the work of each year are reported separately in Parts I and II of this bulletin.

The rations used, with the exception of those fed the vegetable protein groups, were determined on the basis of available animal protein, so that, regardless of the source of animal protein, the actual amount given each group was identical.

General Summary: The major and minor tendencies that were indicated in the work of the first year again appear to reestablish themselves.

The results show that there is a place for milk products in the poultry ration. Efficient and economical production can be obtained by the use of either dried buttermilk or condensed buttermilk in proper combination with meat scrap, or by the proper combination of all three of these foods. When milk products are used the feed cost will be increased; at the same time, an increased egg production is obtained with the result that greater net profit results.

Minor significant trends that were reestablished are: milk products (1) maintain the body weight of the fowls in the most efficient manner, (2) increase the size of the eggs, (3) reduce the tendency toward early molting by increasing production, and (4) maintain a more even production throughout the year.

Part I. December 24, 1922, to October 27, 1923.

Plan of Experiment: The plan of this experiment was to use a number of groups of Single Comb White Leghorn pullets of common ancestry. Animal protein was supplied from three sources: **meat scrap, condensed buttermilk, and dried buttermilk.** These products were used not only individually but also in combination with each other. However, equal amounts of animal protein were fed in each case.

In one ration the amount of animal protein was reduced and in its place vegetable protein, supplemented with a mineral mixture, was added. All pens received the same basal scratch grain and mash mixtures, and the methods of housing and management were identical. The duration of the test the first year of this experiment was from December 24, 1922, to October 27, 1923, a period of 44 weeks.

Choice of Birds. Three hundred and fifty Single Comb White Leghorn pullets were selected for this experiment. They were taken from the regular flock of pullets raised on the poultry plant of The Pennsylvania State College. The birds were not pedigreed, although pedigreed males have been used in the breeding pens for the past seven years. All birds were hatched from April 5, 1922, to May 11, 1922. From this group of bird seven pens, each containing fifty pullets, were made up. Greater care was taken to have each pen uniform in regard to quality and size of birds so that the results obtained might be comparable.

Housing: All birds were maintained in seven pens (Nos. 3, 4, 5, 6, 7, 8 and 9) of the poultry experimental house. This house is of the long-continuous laying house type, equipped with double yards for each pen. Each pen is 12 feet wide and 18 feet deep and is equipped in a similar manner with concrete floor, open front, rear ventilators, trapnests, straw litter, feed hoppers, and watering pans.

Rations: All pens received the same scratch grain mixture consisting of one and one-half parts of cracked corn, one part of wheat, and one-half part of oats. The grain was fed according to the usual seasonal requirements of the birds. The basal mash consisted of 50 pounds of cornmeal, 50 pounds of ground oats, 75 pounds of ground wheat, and 25 pounds of wheat bran. Meat scrap, dried buttermilk, and vegetable protein products were mixed with the basal mash. Condensed buttermilk was fed just as it came from the container. Oyster shell and grit were kept before the birds at all times.

The amounts of the various animal protein concentrates used were based

on the protein analysis of the product. The 20 per cent meat scrap mash was used as a standard mash to establish the protein content of the various rations. The protein analyses of the various products were: (1) **meat scrap 55 per cent**; (2) **dried buttermilk 33 per cent**; (3) **condensed buttermilk 10.95 per cent**. In order to have an equal consumption of animal protein the birds were given larger amounts of the lower analysis products.

Ground Soybeans in the Ration for Laying Pullets. Annual Report of the Director. Bulletin no. 152, November, 1927. University of Delaware Agricultural Experiment Station. Newark, Delaware.

This project has been continued along the same lines as previously reported. The results obtained during the past year are in accord with results obtained in a previous trial. The following conclusions may be drawn:

1. When 150 pounds of ground soybeans and 50 pounds of a mineral mixture, composed of 15 pounds table salt, 22 pounds steamed bone meal, and 24 pounds pure wheat bran, 100 pounds flour wheat middlings, and 100 scraps in a basal mash composed of 100 pounds yellow corn meal, 100 pounds pure wheat bran 100 pounds flour wheat middlings, and 100 pounds of ground oats, ground soybeans were found to be about eighty percent as efficient for egg production as meat scraps.
2. Ground soybeans maintain birds in excellent physical condition during the laying year.
3. The mortality in the soybean pen was considerably below the mortality in the meat scrap pen.
4. Ground soybeans are relished and readily eaten by laying birds. This project will be continued in an attempt to determine the most efficient utilization of soybeans for laying pullets.

Meat and Bone By-Products by Frank T. Shott and S. N. Hamilton. Bulletin no. 49. Dominion of Canada Department of Agriculture. Ottawa 1926.

This bulletin presents for the first time in Canada a detailed review of those highly nitrogenous feeds — the output for the most part of the packing-house. These are necessarily high-priced feeds and for this reason, if for no other knowledge of their composition and nature is essential to their economic purchase and use.

Contents: Descriptions of: Meat meal, meat scrap, digester tankage, meat and bone meal, meat and bone scrap, digester meat and bone tankage, bone meal, blood meal, crakclings, edible fish meal.

Fish Meal as a Live Stock Food by G. S. Archibald. Pamphlet no. 17. Dominion of Canada Experimental Farms.

Summary: The waste of fish and fish scrap in Canada is enormous. Here is a supply of cheap feed as yet but little appreciated or developed.

Concentrated meals are scarce and often not available. Fish meal, where available is a suitable concentrate for cattle and especially for hogs. Fish meal is very rich, containing 55 % to 60 % of protein and over 15 % phosphate of lime.

If of good quality and properly fed with other meals and with roughages, it is fairly palatable wholesome and a good feed for young, growing stock and also for milk production having no injurious effects on the meat or milk.

The greater demand for this valuable food would greatly stimulate its manufacture.

When given a fair trial and used in proper proportions it should become one of the most popular and profitable protein supplements for swine feeding.

The Metabolism of the Carbohydrates in the Chick Embryo.
J. Needham. Le métabolisme des hydrates de carbone chez l'embryon de poulet. Comptes rendus des Séances de la Société de Biologie, Paris, 1927, no. 19, 17 Juin. 1927.

Determinations of the total sugar and of the free sugar in the chick during its development and the total sugar in the rest of the egg by means of the Hagedorn-Jensen method have yielded the following results:

1. During the first week of incubation, it is noted that the amount of free sugar in the egg decreases equally in the white and in the yolk. On the 9th day the white is entirely deprived of free sugar, while the yolk has only lost half its original amount. From this, one may conclude that there is a flow of free sugar to the vitellus, accompanying the flow of water.
2. In the whole egg the amount of glycogen increases continually during incubation; in the embryo this process only takes place after the 11th day, resulting in an actual decrease of glycogen content in the white and in the yolk after the 13th day. This points to the existence in the chick of a „transitory liver” possessing a glycogenetic function analogous to that of the placenta of mammals, a function which comes into play when the chick has reached half way in its development.

Digestibility and Production Coefficients of Poultry Feeds. Texas Agric. Exp. Station. Brazos Country. Bulletin no. 372. Jan. 1928.

Sixty-three digestion experiments, on poultry, are reported, with a compilation of all other digestion experiments on poultry that could be found. Poultry have little power to digest crude fiber, and feeds containing much crude fiber have a low digestibility. Energy-production coefficients for poultry are given, although the basis for such figures is not very satisfactory. The Bulletin gives the approximate average and minimum chemical composition, digestible protein, and productive energy for a number of poultry feeds. It also tells how to calculate the composition and feeding values of mixtures of feeds.

The Effect of various Rations on the Storage quality of Eggs.
Texas Agric. Exp. St. Brazos Country. Bulletin no. 376. January 1928.

Earlier work at the Texas Station showed that cottonseed meal and alfalfa leaf meal were useful feeds for the economical production of eggs. The eggs when newly laid showed no discoloration of yolk or white, but in 1926, it was found that some feeds fed laying hens caused eggs in cold-storage to show discolored yolks and in some cases discolored whites.

A study of the effect of feeding various mixtures of feeds on the storage quality of the eggs produced was begun, and from the results of the first year's work, the Station recommends not over nine per cent of 43 per cent Protein Cottonseed Meal, prime quality, in the mash and not over six per cent in „all-mash ration” during the months when eggs are going into storage. So far as the first year's work shows, the possibility is not eliminated absolutely that bad effects result even from these amounts. Cottonseed meal has been proven to be an economical poultry feed and at times of the year when eggs are not going into storage larger proportions of cottonseed meal may be fed.

A study of some biochemical colour Tests. III Colour reactions associated with vitamin A. by W. R. Fearow. Physiological Lab. Trinity College, Dublin. The biochemical Journal. Vol. XIX 1925, p. 888.

Conclusions:

1. Phosphorus pentoxide forms a deep violet colour in addition to oils containing vit. A.
2. The pigment may be completely separated from the oil leaving a residue deficient in growth-promoting properties.
3. The vitamin enters into the formation of the pigment, probably by condensation with a sterol.
4. It has been found possible to recover the vitamin from the products of hydrolysis of the pigment.
5. Using a 12 % solution of trichloroacetic acid in dry light petroleum as a condensing agent, pyrogallol and other polyphenols interact with oils containing vitamin A. to give stable pigments which are suitable for colorimetry.

A delicate colour Reaction for the Presence of Vitamin A. by O. Rosenheim and J. C. Drummond. Journal of the society of chemical Industry. Vol. 44, 1925, p. 531.

Arsenic chloride gives with cod-liver-oil a brilliant ultramarine-blue colour-reaction, which rapidly changes into violet and gradually fades. It has been found that the reaction is due to or is intimately associated with the growth-promoting vitamin A. The chromogenic substance resists saponification and the reaction is given by the unsaponifiable and growth-promoting fraction of cod-liver-oil (freed from cholesterol by digitomin) in a dilution of 1 in 2 millions. By means of this reaction it has been demonstrated that vitamin A. dialyses through a rubber membrane (against petrol or alcohol) and its gradual destruction by oxidation (air current at water-bath temperature) can be followed. It is suggested that the chromogenic substance is a cholesterol derivative. In a series of over thirty oils and fats complete agreement was found between the colour intensity and the growth-promoting activity as tested by animal experiment.

Effects of various agents on colour Tests for Vitamin A. by S. G. Willimott, Th. Moore and F. Wokes. Biochemical Laboratory — Cambridge — Liverpool. The Biochemical Journal. Vol. XX, 1926, p. 1292.

Cod-liver-oil was exposed to the action of the following A destroying agents: concentrated sulphuric acid, phosphorus pentoxide and ultra-violet light. The following results were obtained:

1. Fearon „pyrogallol” test is non-specific. (This conclusion agrees with the findings of Rosenheim and Webster (1926) working on different lines.)
2. Concentrated sulphuric acid and phosphorus pentoxide are less sensitive tests for vitamin A than arsenic trichloride or antimony trichloride.
3. Using the last two tests as criteria of vitamin A content, parallel results were obtained when following the course of destruction of the vitamin by ultra-violet light. Antimony trichloride, however, seems more suitable for use in quantitative methods, since it gives colours which persist longer.
4. In view of the transient nature of the colours obtained with both these reagents, it is suggested that readings be taken not more than 30 seconds after mixing.

Colour Reactions attribute to Vitamin A. by F. H. Carr and E. A. Price. The Biochemical Journal, 1926, p. 497.

The authors do not claim to give proof that the colour observed is a direct measure of vitamin activity, but say, that as far as their results go they do afford strong support for this view, which was first put forward by Rosenheim and Drummond.

The present communication is made prematurely in the hope that it will induce other workers to join in the effort to prove or disprove the parallelism between the colour tests and vitamin A. activity of the reagents mentioned they found a 30 % solution of antimony trichloride in chloroform (weight in volume), decidedly the most suitable and convenient. Its advantages are:

1. The oil and solvent do not need to be perfectly dry or entirely free from alcohol. (In many of the tests either water or alcohol interferes with the colour). The chloroform employed for dissolving the oil in the antimony trichloride is ordinary B. P. chloroform, that is, it contains 2 % of alcohol. Antimony trichloride is washed with a little chloroform, dried and weighed, then dissolved in chloroform to make a 30 % solution. It is allowed to stand and the clear solution decanted and used from a burette. The oil is dissolved in chloroform (a 20 % solution), and to 0.2 c.c. of this solution, delivered from a 1 c.c. burette, 2 c.c. of the antimony trichloride solution are added. The liquid is at once transferred to a cell and the colour intensity measured against standard glasses in a Lovibond tinto-meter. The amount of yellow increases rapidly and therefore must be quickly read.

A study of the Effect of Heat and oxidation on cod-liver oil as measured by colour Tests by F. Wokes and S. G. Willimott. The biochemical Journal. Vol. 21, 1927, p. 419.

Cod-liver-oil was aerated at different temperatures between 88° and 125° and colour tests were made at frequent intervals for vitamin A. Qualitative agreement was obtained with the four tests, concentrated sulphuric acid, phosphorus pentoxide, arsenic trichloride and antimony trichloride. These results were in agreement with observations made by other workers, using animal experiments.

The results of a preliminary series of tests applied to the oils after aeration indicated that the destruction of the vitamin may have been due to volatile organic peroxides.

Reactions of fatty extracts of certain organs with the antimony trichloride test for Vitamin A. by W. H. Wilson, Cairo. The biochemical Journal. Vol XXI, 1927, p. 1054.

Although in many respects the observations must be regarded as of a preliminary nature, the following conclusions appear to be justified.

1. The fatty extract from the human liver contains a substance giving the same colour reactions as vitamin A in an amount which may be equal to 25 times that found in a good sample of cod-liver-oil.
2. The amount of vitamin A. found in the liver varies within wide limits and may, under some conditions of disease, be no more than $\frac{1}{250}$ of the maximum amount observed to occur.
3. The substance is present in considerable amount in the liver at birth but is not present in an amount detectable by the test used, in the placenta.
4. The extract of livers of healthy animals slaughtered for food. was found to contain from 6—12.5 times the amount of vitamin A. present in cod-liver-oil.

GENERAL

Research in the embryonic evolution of the pancreatic islands in the fowl. Recherches sur l'évolution embryonnaire des îlots pancréatiques endocrines chez le poulet. Par R. Potvin et Max Aron. Comptes Rendus des Séances de la Société de Biologie, Paris, 4 Février 1927, p. 267.

The differentiation between the endocrine islands of the pancreas exist from the 8th to the 9th day.

On the 10th day the growth of the endocrine parenchym progresses rapidly. In the parahepatic zone exist two types of island. Some have the type of Langerhans, which happen more with adult animals and the others are small, ball shaped and not polarized.

These decrease from off the 15th day and disappear with the hatching. The glycogenetic function of the liver goes parallel with the existence of the islands of Langerhans. The first sign of glycogen can from the 12th day of the life manifest itself. From the 14th day on the glycogen increases rapidly.

These symptoms coincide with those by mammals.

Most probably the described type of embryonal islands coincide with the islands of Laguesse of mammals.

Egg and Poultry Market Review. Department of Agriculture. Published by Authority of Hon. W. R. Motherwell, Minister of Agriculture. Weekly trade reports.

Yearly Market Review. Eggs and Poultry 1927. Dominion Live Stock Branch. Poultry Division, Ottawa Canada.

Promoting and Judging an Egg Show by H. L. Shrader. University of Missouri College of Agriculture. Circular 177, Juni, 1926. Columbia, Missouri.

With the rapid growth of the poultry industry in Missouri there has been a marked demand for better quality of eggs. The egg show, whether it be community, county, or state-wide in its scope, furnishes and excellent educational means of promoting interest in better quality eggs.

Certain Characteristics of Hen Eggs by Horace Atwood and Chas. E. Weakley, Jr. West Virginia University. Agricultural Experiment Station, Morgantown. Bulletin 166, September, 1917.

Conclusions:

1. The heavier the egg, the heavier the yolk.
2. The heavier the egg, the smaller is the total percentage of the egg that is yolk.

3. When eggs are laid in cycles the first egg in the cycle is usually the heaviest, the other eggs decreasing in weight according to their position in the cycle.
4. The weight of the yolk usually decreases according to the position of the egg in the cycle.
5. In general, the first egg in all cycles has a lower percentage of total egg that is yolk than has any of the other eggs.
6. The eggs laid by individual hens not only vary widely in regard to their average weight and the average weight of their yolks, but the average percentage of the total egg that is yolk also varies widely.
7. The results indicate that the presence of a considerable amount of animal protein in the ration for laying hens tends to weaken the vitelline membrane.
8. The eggs and yolks from the wheat fed fowls averaged somewhat heavier than the eggs and yolks from the corn fed fowls.
9. In 1915 with the smaller amount of scrap in the ration the percentage of the total egg that was yolk was greater in the eggs from the corn fed fowls; but in 1916 with a larger amount of scrap, the percentage was smaller than in the eggs from the wheat fed fowls.
10. During the second year of the test, the weight of eggs and yolks and the percentage of the total egg that was yolk, were greater than during the first year.

Some Factors Affecting the Weight of Eggs by Horace Atwood.
Agricultural Experiment Station. College of Agriculture, West
Virginia University. Bulletin 201, April 1926.

General Summary:

1. The birds whose individual records have been considered differed widely not only in respect to the number of eggs laid, but also in respect to the mean weight or average size of their eggs. The number of eggs laid in one year from 40 to 214, and the mean annual egg weight varied from 42.27 ± 18 grams to 64.65 ± 17 grams.
2. The rations which brought about a slow growth in the birds in flocks B, D, and F had the effect of reducing the number of eggs laid by these birds, particularly during the pullet year, but did not affect the size of the eggs.
3. The rations supplied to the birds in flocks B, D, and F while the birds were young seemed to have the effect of increasing variability, both in respect to the number of eggs laid and their weight.
4. The mean standard deviation in the weight of the White Leghorn eggs considered in this study was approximately 3 grams and varied from a minimum of $1.52 \pm .09$ grams to a maximum of $6.14 \pm .24$ grams.
5. The eggs attained almost their full weight during the second laying season. The increased weight for the second year as compared with the weight for the pullet year was approximately 9 per cent.
6. The average size of the eggs laid by a bird is a fixed definite and persistent characteristic.
7. The size of eggs depends, in part at least, upon the character of the ration fed. A ration consisting of whole grain only fed in winter reduced the weight of the eggs about 12 per cent.
8. As a rule, the greater the productive capacity of a bird, the smaller is the average decrease in the weight of the eggs which are laid on consecutive days.
9. During the period of maximum production, the decrease in the weight of the eggs laid on consecutive days is at a minimum.

10. With many birds, egg weight fluctuates from day to day in an unaccountable manner and further study of the reasons for the fluctuations is desirable.

Egg Marketing by Farmers in Pennsylvania. The Pennsylvania State College. School of Agriculture and Experiment Station. Pennsylvania. Bulletin 214. August, 1927. A Study of Prices and Costs by Various Methods of Marketing.

The Cost of Producing Eggs with S. C. White Leghorns. The Agricultural Experiment Station of the North Carolina State College of Agriculture and Engineering, Raleigh.

Labor was charged at the rate of 25 cents an hour.

The summary page is very interesting and shows that each hen's share in flock depreciation was 70 cents; her feed cost was \$2.047; the cost of her attendant 23 cents 5 mills; the depreciation in buildings was 25 cents 7 mills and the interest on money invested in stock and feed was 11 cents and 11 mills. The final cost per hen was \$3.54 and the returns from each hen was \$5.94, making a net profit per bird of \$2.40.

It required 6 pounds of feed to produce one dozen eggs. The feed cost of the eggs was 15 cents per dozen and the balance of the overhead was 10 cents per dozen, making the eggs cost 25 cents a dozen to produce.

The total commercial value of the eggs as table eggs was \$3,960.48, the cost of operation was \$2,347.75, leaving a net profit on the flock of \$1,980.48.

Seasonal Broiler Production. The Pennsylvania State College. School of Agriculture and Experiment Station. State College, Pennsylvania. Bulletin 216, October, 1927.

Summary:

1. One thousand five hundred and forty-seven chicks were placed in the brooder house; of this number 1,141 broilers were marketed, or 73.88 per cent of the original number.
2. The mortality ranged from 22.2 per cent to 34.2 per cent. These chicks, purchased from a large hatchery, were infected with bacillary white diarrhea (*Salmonella pullorum*) which accounted for a considerable portion of this mortality.
3. It required 9.32 pounds of grain and mash and 17.75 pounds of liquid buttermilk in the liquid milk groups, and 10.16 pounds of grain and mash in the other groups to raise a broiler to marketable age.
4. Growth was fairly uniform in all groups, as the broilers sold from the eleventh week to the end of the experiment averaged as follows:

House No. 1—2.16 pounds	House No. 2—2.29 pounds
House No. 3—2.07 pounds	House No. 4—2.16 pounds
House No. 5—2.05 pounds.	
5. It cost \$.2815 to produce one pound of broiler, and, on the average, \$.3012 per pound was received.
6. In considering the distribution of production costs, it is interesting to note that 46.7912 per cent went for feed; 9.0609 per cent for coal; 22.4215 per cent for labor, and 21.7263 per cent for chicks.

7. The loss of weight of birds during shipments from State College to New York City averaged 14.27 per cent for all broilers shipped. The lowest shrinkage was 6.38 per cent and the highest 18.4 per cent. This shrinkage represented a monetary loss of \$ 95.48. It is advisable to remove broilers from a liquid milk diet about two weeks before shipment is made in order to lessen loss of weight in transit.
8. It is evident, in order to make a satisfactory profit in producing broilers for special market seasons, that (1) disease-free chicks should be used, (2) a low mortality must be secured, and (3) a good market must be near at hand so that shrinkage in shipment may be avoided.

New Jersey Agriculture. Published monthly at Rutgers University. The State University of New Jersey. To acquaint Jerseyemen with the activities of their College of Agriculture — Agricultural Extension Service — Agricultural Experiment Station. Contains articles on poultry f.i. May 1928. Fatten them in Crates by Prof. W. C. Thompson. New Brunswick, N. J.

Operation of a Four Unit Farm Poultry Plant. The Agricultural Experiment Station of the North Carolina State College of Agriculture and Engineering, Raleigh. Bulletin no. 251, February, 1927.

The results given in this bulletin cover the operation of a 200-hen flock of Single Comb Rhode Island Red poultry at the Coastal Plain Experiment Station located in Pender County near Willard. The bulletin shows the possibilities for poultry on the average North Carolina farm. The feed used was bought under local conditions and the products — both eggs and broilers — were sold under local conditions. Everything in connection with the operation of the plant was bought and sold within the State. The results of this test and others conducted in recent years show that farm poultry can be made to pay.

Space is not given in this bulletin to a description of construction of poultry houses and methods of care and management. These subjects are covered in the following extension circulars which may be secured free from either the Agriculture Editor or the Poultry Department of the North Carolina State College.

Extension Circulars:

- No. 161. North Carolina Poultry Houses.
- No. 158. Feeding for Egg Production and Fattening Fowls.
- No. 156. How to Cull the Poultry Flock.
- No. 155. Natural and Artificial Incubation and Brooding of Chickens.
- No. 160. Parasites of Poultry.
- No. 154. Common Diseases of Poultry.

Poultry Management. As portrayed by „The Better Poultry Special”. Colorado Agric. College. Fort Collins. Nov. 1927.

From the Introduction: Raise better poultry!

Not more poultry, but better poultry was the big idea which confronted us as we visited the „Better Poultry Special”. From the time we entered the train until we passed out of the sixth exhibit car, we couldn't escape the compelling plea for better poultry, produced more economically.

All of us took the hint that there was greater need for poultry in

ment than for poultry expansion in the five states thru which the Burlington-Colorado and Southern train was scheduled; namely, New Mexico, Colorado, Wyoming, Montana and South Dakota. The exhibits in the train were based upon the results of scientific investigation and actual practices followed on demonstration farms. Colorado and Wyoming furnished birds from farm flocks to verify the truth of assertions appearing upon the posters above the exhibit pens.

Agricultural agents of the two roads made it clear that better handling of our poultry, which would give us greater profit, would result very satisfactorily for them. The agricultural colleges of the five states interested furnished cooperation in the form of exhibits, bulletins and talks by their specialists.

In bringing to us the story of a successful farm poultry flock, the train emphasized certain principles and practices which are absolutely necessary if better poultry is to be produced more economically. These points were:

1. Careful selection of the breeding stock.
2. Culling.
3. Proper housing.
4. Correct feeding.
5. Sanitation of house and grounds.
6. Intelligent marketing of poultry products.

These points emphasized on board the train were still more forcibly brought home to us thru the demonstration given by two rural girls of Logan County, who won the state championship in poultry demonstration at Colorado state fair in 1927. Adults present at the demonstration were convinced that children, thru their 4-H club work, can learn the principles of profitable poultry raising just as thoroly as the grown-ups can.

Colorado Farm Flock Poultry House. O. C. Krum and O. C. Ufford. Colorado Agricultural College. Extension Service. Fort Collins. Colorado. Description and Drawings. June, 1924.

* *Rearing Chicks in Confinement.* T. B. Charles and H. C. Knandel. Bulletin 218, Jan. 1928. The Pennsylvania State College. School of Agriculture.

Results:

1. The mortality from hatching time to maturity on 4,289 chicks brooded was 10.2 per cent.
2. All birds possessed deep yellow pigmentation throughout the brooding period and at maturity.
3. A very uniform growth was obtained in all groups.
4. The so-called meat variety of fowls weighed considerably more than when allowed free range.
5. The egg production of all groups to date has been far in excess of former years.
6. The outstanding fact is that to date, December 1, 1927, the bacteriologist in poultry diseases has been unable to find an intestinal parasite of any kind in any of the birds that died and no paralysis has been observed.

It may not be necessary to install this confinement system generally, but those who have suffered severe losses from intestinal parasites in chicks can well afford to give such a method a fair trial.

Principles of Incubator Operation by O. C. Ufford. Colorado Agric. College. Fort Collins, Colorado.

Contents: The proper temperature, moisture, ventilation, eggs, repairing and cleaning the incubator.

Colorado Commercial Laying-House by O. C. Krum and F. L. Cooper. Colorado Agric. College. Fort Collins.

Contents: The type of house, economy of labor, construction and materials, appliances, cost of construction, several drawings.

Inquiry.

One of our European Members asks informations about an egg-cleaningmachine by sand-spray under air-pressure. Please send informations to Editor.

INTERNATIONAL REVIEW **OF POULTRY SCIENCE**

OFFICIAL ORGAN OF THE
INTERNATIONAL ASSOCIATION
OF POULTRY INSTRUCTORS
AND INVESTIGATORS

EDITOR:

Dr. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

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INTERNATIONAL ASSOCIATION OF POULTRY INSTRUCTORS AND INVESTIGATORS.

**Minutes of meeting of European Members of Council, held
September 13th., 1928, at the Crystal Palace, Sydenham, London.**

Present: Professor Fred. C. Elford (President) in the Chair; Dr. Edward Brown (Honorary Past President), Mr. Percy A. Francis (England, Director of the 1930 Congress), Dr. B. J. C. te Hennepe (Holland, European Secretary), Professor A. Ghigi (Bologna, Italy), Miss M. Hennerty (Irish Free State), Miss A. Kinross (Scotland), Mrs. T. Newman (Northern Ireland), Mr. Tom Newman (England), Mr. T. R. Robinson (England), Dr. Schachtzabel (Berlin, Germany), Professor Ch. Voitellier (Paris, France), Dr. L. Weinmiller (Erding, München, Germany), Professor J. F. Frateur (Louvain, Belgium), Mr. V. E. Wilkins (sec. of the 1930 Congress, London) and Mr. Sydney Smith (in place of Dr. J. E. Gordon (Northern Ireland)).

The meeting was opened by President Elford at 11 a.m. In extending a welcome to the members of Council present, some of whom had incurred considerable expense in time and money for the benefit of Poultry Science, he said that he felt there is a great future for the International Association, and that every day its opportunities appear to be greater. He referred to the fact that there is a work to be done outside of Poultry Science for international fellowship and goodwill.

In the name of Societies and friends in the United States and Canada he presented to Dr. Brown an illuminated address as a mark of their esteem on his retirement from the Presidency of the Association. To this Dr. Brown made a fitting response and spoke of the possibilities of the Association.

Mr. P. A. Francis informed the Council of the steps that had been taken by the British Ministry of Agriculture, as representing the government, in preparation for the 1930 Congress, and announ-

ced that their Majesties the King and Queen, and H. R. H. the Prince of Wales, had consented to become Patrons. Explanations were given as to the officers of the Congress, whose names will be announced in due course.

Consideration was given as to the most suitable dates for the 1930 Congress. It was felt that the latter half of July would be most convenient, probably commencing about July 20-21 of that year, and lasting for eight days. This, it was agreed, should be reported to the Executive Committee. Dr. te Hennepe called attention to the fact that an International Veterinary Congress was to be held in London August 4th. to 8th., 1930. As many veterinarians are interesting themselves in Poultry, the arrangements named would fit their convenience if they decided to attend the World's Poultry Congress.

Professor Frateur submitted that at previous Congresses too many papers were sent in, and that sufficient time was not given for discussions. He suggested that a Committee should be appointed to select the most suitable papers. Professor Ghigi suggested that all papers should be revised by each National Committee, and did not agree with the proposal that a Central Committee should have the power to reject papers sent in by these. The question was one that should be carefully considered by the Executive Committee.

The subject of Post Congress Tours was considered. Prof. Frateur suggested that some of the places within easy reach of London might be visited in the afternoons of the Congress days. It was agreed to recommend that the British Tours, other than those near London, should immediately follow the Congress for, say, two weeks, and those on the Continent of Europe be for, say, two weeks subsequent.

With respect to the Membership of the Congress, it was agreed on the proposal of Prof. Frateur to suggest to the Executive Committee, that lower fees be granted to countries with a depreciated exchange.

The Finances of the International Association were discussed. The President stated that the time had been reached when a determined effort should be made to conduct the International Association on a sound financial basis, so that they might go forward

without having to worry where the money was to come from. He thought that this could be done in two ways, by increasing the membership, and interesting governments so as to secure support from these. He indicated that it was likely the latter would, in some cases, be forthcoming.

Dr. Schachtzabel suggested it would be dangerous to interest the governments, as the Association might lose its independence. He expressed the opinion that support could be obtained from Poultry Associations, and said that the German Association would be willing to contribute.

Dr. te Hennepe urged that strenuous efforts should be made to induce more governments to become Patrons by subscribing £ 5 per annum. He agreed that Poultry Associations be interested. It was pointed out that up to the present time the number of members was insignificant as compared to what ought to be the case. Various other suggestions were made and left for further consideration.

A tribute was paid to Dr. te Hennepe for the work he had done as Editor of the International Review. It was agreed (1) that the Review should be exchanged with poultry journals, (2) that the Review subscription for non-members should be £ 1 (five dollars) per annum, and (3) that advertisements should be accepted for it at a rate of £ 5 for a full page, and £ 3 for half a page. It was agreed that all advertisements should be printed on coloured paper.

The European Members of the International Association, together with the Executive Committee of the World's Poultry Congress, 1930, were entertained to luncheon by the British government. At this function Sir Charles Howell Thomas, K.C.B., Secretary to the Ministry of Agriculture & Fisheries presided, and President Elford was the speaker.

Later a joint meeting of the Council of the International Association and the Executive Committee was held, at which various questions were considered.

EDWARD BROWN

BORN SEPTEMBER 8th 1851



Commenced to breed Standard-bred Poultry in 1873 and became successful Exhibitor.

Won the First Cup offered for Leghorns in Britain at the Crystal Palace Show, 1875.

Original Member of The Leghorn Club (the first Breed Club) and of the (English) Poultry Club, 1877.

Commenced in 1879 series of observations in European Countries studying Poultry methods and conditions, which have extended as far eastward as Russia and the Balkan States, and to all parts of North America.

Became Poultry Editor of *Live Stock Journal*, London, 1880.

In 1887 undertook commission of enquiry on behalf of the *Freeman's Journal*, Dublin, into the Poultry Industry of Ireland and its potentialities. This laid the foundations of developments which has placed that country in the leading position in respect to egg and poultry production in relation to its area.

In 1892, by lectures and classes, under County Education Authorities, throughout Great Britain and Ireland, inaugurated instruction in Poultry Husbandry which have led to great developments and continues until the present time, reaching both urban and rural communities.

In 1895 became lecturer on Poultry Husbandry at the Reading College, and in 1898 established the College Poultry Farm, Theale, for practical training and experimental work.

In 1899 became Honorary Secretary of the National Poultry Organisation Society of England, and so continued until 1913.

In 1912 was elected the First President of the International Association of Poultry Instructors and Investigators, holding that position until December 31st, 1927.

Was Joint President of First and Second World's Poultry Congresses at The Hague, Holland, 1921, and Barcelona, Spain, 1924, and Sole President of the Third at Ottawa, Canada, 1927.

In 1920 founded the National Poultry Council of England, and was elected its First President. On termination of his Presidential Year in 1921, accepted the position of Secretary.

Since 1911 has largely devoted his efforts to the establishment of the National Poultry Institute (England) which is now in operation, largely by a grant secured from the British Government of £ 50,000 for equipment and maintenance, supplemented by a contribution of £ 6,500 by those engaged in Poultry Husbandry. This Institute consists of six sections: (1) the Central Institute at Newport, Salop, for higher teaching and practical experiments; (2) Breeding Research Station, Cambridge University; (3) Nutrition Research, Cambridge University; (4) Disease Research Station, Addlestone; (5) Egg Breeding Station, Reaseheath; and (6) Table Poultry Breeding Station, Wye.

Mr. Brown has been a voluminous writer in British and American journals, and has written the following works:

Practical Artificial Incubation (1879).

Profitable Poultry Keeping (1883, under the pen name of Stephen Beale).

Profitable Poultry, in connection with Commission in Ireland, (Dublin, 1889).

Poultry: Varieties of, &c. (1889).

Poultry Keeping as an Industry for Farmers and Cottagers (1891).

Industrial Poultry Keeping (1892).

Pleasurable Poultry Keeping (1893).

Poultry Fattening (1896).

Races of Domestic Poultry (1906).

Poultry Husbandry (1915).

Poultry Keepers' Vade-Mecum (1921).

Also the following reports:

Report on the Poultry Industry in America (1906).

do. do. in Denmark and Sweden (1908).

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do.	do.	in Belgium (1910).
do.	do.	in Germany (1912).
do.	do.	in Wales (1915).
do.	do.	in The Netherlands (1921).

Was elected a Fellow of the Linnean Society of London (F.L.S.) November, 1880.

Has been a Member of the Royal Agricultural Society of England since 1885.

On August 5th., 1927, the Mc.Gill University, Montreal, Canada conferred upon him the Honorary Degree of Doctor of Laws in recognition of his work in the proportion of Poultry Husbandry.

TO THE MEMBERS OF THE INTERNATIONAL ASSOCIATION.

In the annual report sent to you early in the year the necessity of increasing the Association membership was mentioned. I desire again to call your attention to this matter since it is absolutely necessary in order to have the International Association succeed in its purpose. Many countries are still not represented and the list for most of the countries is far too small. May I again urge each member of the Association to take it upon himself personally to help increase our enrollment.

The Poultry Industry has now reached a point of development where it is no longer confined to restricted areas but has become international in character. Therefore, the need is greater to-day for some agency to promote the advancement of the Industry on this basis. This can be done by the International Association if it can enlist the support of the persons and organizations connected with the Industry.

The Association needs the interest and support of every person who is desirous of seeing the Advancement of Poultry Science. These persons in turn cannot afford to miss the benefits which the Association will return to them.

Every country in which it is possible to raise poultry should be fully represented in the Association. Let us see to what extent this can be accomplished. Let us not only make a special effort now but also strive for a progressive, healthy, yearly growth.

You can secure regular application blanks from the Secretary, but do not delay because of this. If you do not have a blank at hand just send a letter to Dr. te Hennepe or myself giving the names of the persons interested.

G. F. HEUSER,
Secretary — Treasurer.

NUTRITION

Meat and Bone By-Products, an investigation towards the establishment of Standards. By F. T. Shutt and S. N. Hamilton. Dom. of Canada Dep. of Agriculture. Bulletin no. 49. Ottawa 1926.

This bulletin presents for the first time in Canada a detailed review of those highly nitrogenous feeds — the output for the most part of the packing-house. Much confusion exists in respect to the meaning attached to the names under which they are sold. Contents Descriptions and figures of analyses of different samples of meat meal, meat scrap, digester tankage, meat and bone meal, meat and bone scrap, digester meat and bone tankage, bone meal, blood meal, cracklings, edible fish meal.

The rate of passage of food through the digestive tract of the hen, M. H. Keith, L. E. Card, and H. H. Mitchell (Jour. Agr. Research (U.S.), 34 (1927), No. 8, pp. 759-770).

Two experiments are reported from the Illinois Experiment Station on the time required for whole corn, ground corn, and a mixture of ground corn and tankage 4 to 1 to pass through the digestive tract of hens. In preparing the hens for the experiment, they were fasted 60 hours, during which time they had access to water but no feed or grit. After this period they were fed 50 gm. of the feed. In the first experiment water was kept before them after feeding, and in the second test 75 cc. of water was given each bird, part of it mixed with the feed and the rest fed with a pipette. The birds were placed in separate cages and killed at varying intervals after feeding. The digestive tracts were removed, segmented, and the contents dried and weighed promptly. The sections used were (1) crop and tubes down to the proventriculus, (2) gizzard and proventriculus, (3) small intestine from gizzard to caeca, (4) caeca, and (5) large intestine including the cloaca. The excreta was also collected, dried, and weighed.

There was a wide variation in the rate of passage of the food between the various hens. Usually whole corn had left the crop by the end of 12 to 15 hours. The ground corn remained in the crop much longer than whole corn and somewhat longer than the ground corn and tankage. The amount of dry matter in other parts of the digestive tract did not differ materially with the three kinds of feed. The amount of dry matter in the gizzard in addition to the grit was larger while feed remained in the crop, and the same was more or less true of the small intestine.

The percentage of moisture in the crop varied widely and appeared to be independent of the kind of feed and the interval after feeding. In the gizzard the moisture content varied from 30 to 60 per cent, and was usually about 1.5 to 2 times that of the dry matter not grit present. The moisture percentage in the small intestine averaged between 82 and 86 per cent., in the caeca 70 to 80 per cent., and in the large intestine 75 to 85 per cent. The amount of grit in the gizzard ranged between 3 and 15 gm., but no connection was observed between the amount present and any other factor.

U. S. Department of Agriculture. Farmers' Bulletin No. 1541.
Washington D.C. October 1927.

Efficient feeding practices are necessary to make poultry raising most profitable and to produce the best quality of products.

The feed is the most important cost factor in raising poultry. Therefore the selection of feeds and the method of feeding are very important matters.

In feeding all classes of poultry a proper balance of the various nutrients is necessary, especially proteins, carbohydrates, minerals, and vitamins.

In this bulletin the relative value of the different nutrients is discussed and methods of feeding chickens for different purposes are outlined.

This bulletin supersedes Farmers' Bulletin 1067, Feeding Hens for Egg Production.

Feeding for Egg-Production by E. A. Lloyd, V. S. Asmundson,
Poultry Dep., Univ. of British Columbia 1927.

Table of contents: Introduction, stock used, feeding methods, feeding-stuffs, rations used, egg-production, feed consumption, receipts and costs, summary and observations.

Summary: Four pens of 100 pullets each of four popular commercial breeds in B. C. (W. L., W. W., B. Rocks, R. I. Reds) were fed for egg-production under similar conditions for a period of 52 weeks.

The following average amounts of the feeds were consumed by the birds in 52 weeks.

	Leghorns	Wyan- dottes	Rocks	Reds
Scratch	41.79	43.39	43.40	43.51
Mash	45.53	53.66	56.73	50.48
Total . .	87.32	97.05	97.13	93.99

Feed consumption depends upon the breed, rate of egg-production and the condition of the birds.

January, February and the latter part of the summer were found to be critical periods in the laying year.

The average egg-production, receipts and cost of feed of the different breeds were as follows:

	Leghorns	Wyan- dottes	Rocks	Reds
Production	204.80	193.98	181.73	170.04
Receipts	\$ 7.34	\$ 7.08	\$ 6.31	\$ 6.31
Cost of feed.	2.77	3.08	3.06	2.94
Receipts over cost of feed . .	4.57	4.00	3.25	2.82

Poultry Feeds and Feeding by G. Robertson. Dom. of Canada.
Dep. of Agriculture. Bulletin no. 1, 1025.

Introduction: It has been the endeavour to make the subject of feeds and feeding as simple as possible. While it has seemed advisable to try to familiarize the uninformed reader with the more common scientific terms, this has been done only to such an extent as will permit the reader to study and mix feeds intelligently. Where ever terms that might be unusual to ordinary poultry keepers are used, care has been taken to explain them as simply as possible, so that any person reading the bulletin through should have no trouble in following it.
Description of food-stuffs, rations, feeding methods.

Feeding for Eggs. Michigan State College by C. M. Ferguson.
May 1927.

Description of the nutrients, inorganic and organic, Composition of the summer feeding schedules at Michigan laying contest.

Useful Facts concerning foodstuffs employed in Poultry Rations
by W. C. Thompson. Hints to Poultrymen. New Jersey
Agricultural Exp. St. New Brunswick. March 1928.

Description of the nutrients, inorganic and organic, Composition of the Fowl and the Egg, Commonly used Foodstuffs — Why use them?, the nutritive ratio.

The value of Carcase Meal.

The associated German Carcase Meal Manufacturers have for some time been carrying on a bitter campaign against foreign meat-meal. It is stated that the German meal is better than foreign, viz. Argentine meal.

It is asked whether the German meal, which is much cheaper than foreign, is of equal quality with the latter.

A tankage factory in Holland states that foreign meal is not to be trusted as regards the sterility and pathogenic germs and in some papers it is stated that the foreign declarations of health added to the meal do not prove that the meal is obtained from healthy animals.

Dr. te Hennepe has pointed out in the Dutch press that great uncertainty exists in the literature regarding the question as to whether poisons in the carcasses are destroyed by the high temperatures (150° C.). Further the question is asked by him as to which process of manufacturing is the best (dry or wet rendering) and if the albumen or carcasses in a state of decomposition (carcase meal) have the same nutritious value as those of freshly slaughtered animals (packers-meal).

Further the question has been asked by him whether the unpleasant smell of carcase meal is damaging to the eggs and whether the meal with extract (stick) is better than meal without extract.

Careful tests in connection with these problems are of considerable importance for the poultry world and Dr. te Hennepe would greatly like to have any literature referring thereto.

Ueber Bildung vom Antirachitischen Vitamin unter Lichtabschluss.
By A. Schittenhelm and B. Eisler, Medizinische Klinik in Kiel.
Klinische Wochenschrift, 10 Juni 1928, p. 1118.

The experiments of Hess, Rosenheim, Windaus and Pool came near to solving the problem of the chemical qualities of the anti-rachitic vitamin. One of the chief problems now is whether ergosterin is identical with vitamin D or whether there are other substances which act anti-rachitically.

Substances which are not the same as ergosterin have however an **anti-rachitica**l effect, viz. digitaligenin, acetyldigitaligenin.

The writers observed that root germs of barley besides containing vitamins A, B, & E, also contained vitamin D. Under the influence of light these germs did not increase but on the contrary they were damaged. Although barley does not contain any anti-rachitica

l qualities, barley germs which have been bred in darkness do possess these qualities. Vitamin D therefore germinates in darkness.

Völtz discovered that grass (*Lolium perenne*), which had been grown in darkness, also contained vitamin D. For the germination of anti-rachitica

l substances, therefore, light energy is not absolutely necessary.

L'Industrie de l'Equarrissage by H. Martel. Dunod. Paris 1928.

As meat-meal is of considerable importance in the feeding of fowl this book is worthy of great interest.

In France there are 30 factories while 165 institutions have been closed on account of their not working efficiently.

Through the war foreign methods became known and have been taken as examples.

The book describes the industry, the transport of carcasses, the various methods of working and the manufacture of the finished products etc.

✕ *Decrease of Resistance owing to Lack of Vitamin D. Resistenzverminderung infolge Vitamin D. Mangel* by W. Eichholz and H. Kreitmarl, *Münchener Medizinische Wochenschrift*. T. 75, p. 79-81.

Full grown rats and mice also need Vitamin D. Animals which did not obtain sufficient Vitamin D died of spontaneous paratyphus, whereas test animals remained healthy. In tests made with pathogenic pneumococci all the mice which did not obtain sufficient Vitamin D died whereas only 50 % of the test animals died. Therefore, besides the specific effect, Vitamin D has a general effect in connection with the general power of resistance. The sensitiveness of parasitica

l diseases is also increased by lack of vitamins.

Influence of Nutrition on Composition of Eggs. Influence de l'alimentation sur la composition quantitative de l'oeuf de poule by Terroine and Belin. *Bulletin de la Société de Chimie biologique*, t., 1927, p. 1074.

The mutual comparison of the various parts of the egg (white, yolk, shell) vary greatly but these variations are independent of the system of feeding.

DISEASES

Poultry Diseases. Including Diseases of Other Domesticated Birds.
With a Chapter on the Anatomy of the Fowl by B. F.
Kaupp, B.S., M.S., D.V.M.

Foreword to fourth Edition: The fact that three large editions of *Poultry Diseases* have been sold in so short a time and an increasing demand making the fourth edition possible is evidence that this book has filled a long felt want and is used as a textbook in colleges and a reference book by veterinarians, students and poultrymen alike over the world.

The fourth edition has been thoroughly revised and brought down to the minute, and is the last word in poultry pathology. The number of pages have been increased from 342 to nearly 400 and the number of pictures from 134 to 158, increasing the photographs showing appearance of the sick bird as it appears in the poultry yard to more than thirty, with photographs and photomicrographs of parasites, bacteria and appearance of diseased organs seen at autopsy, together with many charts illustrating the cycle of parasites and disease.

Much space is given to sanitation, hygiene, disinfection and causes of disease, with a complete outline for post mortem examinations which will aid in training the new beginner in quickly recognizing disease at post mortem.

Some of the outstanding topics are the effects of feed upon the health of birds and on their growth and production. Chick rearing troubles, various forms of paralysis, deficiency disease, tumors, respiratory diseases, and parasites.

Following an introductory chapter on anatomy of the domestic fowl there is a new feature discussing fully the physiology of the fowl. Complete discussions and methods of detection and the control of bacillary white diarrhea, fowl typhoid and cholera, blackhead, fowl pest, respiratory diseases, limberneck and tuberculosis, with methods of carrying on diagnostic methods, preparation of vaccine and other control measures, and last but not least may be mentioned a chapter on *Poultry Materia Medica* and dosage of drugs.

In the revision and bringing down to date of this data care has been exercised to give the latest thought of the Avian Pathologist in regard to efficient and effective line of treatment for each disease where treatment for each disease is advisable.

A Note of infectious Necrosis of canary Birds by R. L. Cornell,
Institute of Animal Pathology, Cambridge. The Veterinary
Journal, July 1928, p. 350.

Description of a small outbreak of this disease in an aviaries of a firm of commercial distributors. Post mortems, histology of the lesions in spleen and liver, characters of the causal bacillus, pathogenicity and literature.

On natural Immunity, by F. A. E. Crew. Animal Breeding Research
Department University of Edinburgh, 1928.

The problem being considered is whether or not species and races are characterised by differences in their susceptibility and immunity to disease.

Evidence is slowly accumulating which tends to show that immunities, like susceptibilities are transmitted as genetic characters, taking the form of

anti-bodies in the blood. Results with mice agree with the assumption that susceptibility and resistance in this case constitute a single factor pair, that resistance is the dominant member of the pair.

Mortality in Chickens following the feeding of massive Doses of virulent Fowl-typhoid Bacteria by W. V. Lambert and C. W. Knox. Iowa State College. Ames. Iowa. Journal of the Am. Vet. Med. Association. 1928 August, p. 480.

In connection with a study to determine the part that inherited factors may play in resistance to fowl-typhoid, the authors have had occasion to observe on a large scale the mortality due to this disease following the feeding of massive doses. Each bird was fed 6 cc. of a 20 hour infusion broth culture of the organism. The heaviest mortality occurred between the 6th and 15th days. There were 115 survivors out of 220 birds infected and 105 that died. There was much variability in the degree of reaction as shown by the clinical observations in both the birds that died and those that recovered. Many of the birds that recovered have been used in the breeding flock. The exact role of inborn factors for resistance or susceptibility to the different diseases is as yet unknown. Due to the complexity of resistance, any studies attempting to assign a role to inborn resistance must be carefully controlled from the standpoint of degree of infection, virulence of the infecting organism, condition of infected animals and general environment.

Immunisation against Diphtheria by S. Zibert. Jugoslovenski veterinarski glasnik. VIII, 1928, p. 27.

Inoculation with cocci, cultivated from the diphtheric membranes.

Klein Disease in Hen. Enteritis infectiosa by S. Plasaj. Jugoslovenski veterinarski glasnik. VII, 1927 (ib. 1928, p. 25-26) p. 65-66.

Description of the first case of this disease in Zagreb and in Banja Luka. Description of Bac. pullorum in adult hens in Zagreb.

A worm (ascaris) in the shell of an egg. Ascaridia incrusté dans la coquille d'un oeuf de poule by M. Henry. Bulletin de l'académie vétérinaire de France. T. 1. May 1928.

A case of a worm on the surface and in the shell of the egg. Although parasites in the albumen are not so seldom, a worm in the shell is only known in 5 cases during the period from 1642-1928.

* *A study of Fowl Paralysis. Neuro-Lymphomatosis Gallinarum* by A. M. Pappenheimer, L. C. Dunn and V. Cone. Storrs Agricultural Exp. Station. Storrs. Connecticut. Dec. 1926.

Conclusions:

1. Fowl paralysis (neuro-lymphomatosis gallinarum) is a disease entity, with characteristic clinical and pathological features.

2. The disease occurs in all parts of the U.S., Holland, Austria and probably South-America.
3. The disease appears to be endemic in certain foci. Having once appeared, the disease tends to persist through successive years.
4. It occurs with about equal frequency in both sexes; all common breeds may be affected.
5. Symptoms appear between the 3rd and 18th month. Typical clinical cases have not been observed outside of these limits.
6. The conspicuous symptoms are (a) asymmetrical partial and progressive paralysis of wings and both legs, and rarely of neck muscles. (b) Occasional grey discoloration of iris, with blindness. Nutrition is usually preserved.
7. The duration is variable; the outcome is usually fatal, but spontaneous recovery may rarely occur.
8. The principal pathological changes are found in the nervous system. In the peripheral nerves, the essential feature is an intense infiltration of lymphoid, plasma cells, and large mononuclears. This is accompanied by a myelin degeneration in the more advanced lesions, but the cellular infiltrations appear to precede the degenerative changes. In brain and cord and meninges, there are similar infiltrations predominantly perivascular.
Infiltrations of the iris with lymphoid and plasma cells are found in the cases showing gross discoloration of the iris.
Visceral lymphomata, originating in the ovary, are associated in a certain percentage of the cases. Evidence is presented in favor of the view that this association is not accidental, and that the lymphomata are a manifestation of the disease.
9. Infiltrations of the spinal cord and brain, rarely of the peripheral nerves, are frequently present in birds showing no clinical symptoms. These are interpreted as mild cases of the same disease.
10. No micro-organisms have been demonstrated in the tissues or by cultural methods.
11. The disease is transmissible to other chickens by subdural or intramuscular injection of suspensions of the nervous tissue of paralysed birds. Only a certain proportion, not over 25 per cent. of chickens, develop the disease after inoculation. This is taken to indicate a widespread immunity, either natural or acquired in the course of the experiment.
12. No relation has been found between paralysis and infestation with coccidia or intestinal worms.
13. The name neuro-lymphomatosis gallinarum is suggested for this disease.

Bacillary White Diarrhea and the agglutination Test by J. F. Olney and O. Bederke. Univ. of Nebraska, Lincoln, Nebraska. *Journal of the Am. Veterinary Medical Ass.* July 1928, p. 350.

From the post mortem examination of birds giving positive and negative reactions to the macroscopic agglutination test, it appears that a great majority of infection carriers react to the test. That repeated, yearly tests of breeding stock, together with proper sanitation and a vigorous culling of unthrifty chicks will control the disease is almost beyond question.

The results obtained by the writers agree with the majority of experimental workers, that the chick viability from tested fowls is high.

Preparation of Salmonella pullorum antigens for complement fixation tests. Complement fixation and agglutination tests for

S. pullorum infection by L. D. Bushnell and C. B. Hudson.
Journal of infect. diseases 1927, p. 383, 388.

Description of methods to prepare antigen for complement fixation.

Desinfection in fowlpest. Desinfektionsversuche bei Geflügelpest mit Sulfoliquid. D. S. by Dr. F. Gerlach. Bundesanstalt für Tierseuchenbekämpfung in Mödling bei Wien.

Archiv für wissenschaftliche Tierheilkunde 1928, p. 110.

Fowlpest virus was killed by a 5% sulfo-liquid solution immediately.

The danger to Man of Bovine and Avian Tuberculosis by C. H. Mayo, Rochester, Minn. Journal of the American Veterinary Medical Association. September 1928, p. 563.

Although it is often demonstrated that the human being is infected with bovine tuberculosis, the avian type is very rarely found in man; Mayo has had two patients in whom avian tuberculosis was demonstrated, and also Lederer, Loewenstein, Pausini, Nocard, Plum and others encountered avian bacilli in human lesions.

Murphy of the Rockefeller Institute claims he is finding avian infection in some cases of Hodgkin's disease, Van Es has done considerable investigation of this subject. He says: Just as long as we have bovine, avian and human tuberculosis, there will be tuberculosis of swine for the same reason that the elimination of human tuberculosis can never be complete as long as bovine infection remains a real or potential source of mischief.

The antigenic Relationship of Bacterium Pullorum, Bacterium Gallinarum and Bacillus Aertrycke (B. Pestis caviae) by F. P. Mathews Lafayette. Ind. Dep. of Veterinary Science. Purdue Univ. Agric. Exp. Station. Journal of the American Veterinary Medical Ass. Sept. 1928, p. 608.

Summary: Antisera for *B. pull* and *Bact. gallinarum* agglutinated five out of seven strains of *B. aertrycke*. The agglutinins produced by the 5 *aertrycke* strains were separated into two parts by absorption with *B. paratyphosis* B. The unabsorbed agglutinin appeared identical with that produced by *Bact. pullorum* and *Bact. gall.* Eight out of 12 hens injected with 5 strains of *B. aertrycke* were immune to *B. gallinarum*.

Two strains of *B. aertrycke* exhibited antigenic properties resembling those of *B. paratyphosis* B. Four hens injected with these two strains of *B. aertrycke* were not immune to *B. gallinarum*.

Report of an outbreak of Poisoning in the Domesticated Fowl, due to Death Camas by K. W. Niemann, Kansas Agric. Exp. Station Manhattan, Kansas. Journal of the American Veterinary Medical Association. Sept. 1928, p. 627.

Conclusions:

1. The occurrence of death camas (*Zygadenus*, family *Melanthaceae*)

- poisoning in domesticated birds is probably rare, but may occur.
2. Treatment consists in confining all unaffected birds until danger of grazing upon the plant no longer exists. Purgatives and isolation are recommended for affected fowls.
 3. Prophylactic measures consist in recognizing the plant and keeping the birds away from it.

Salmonella Pullorum Infection in Rabbits by J. F. Olney. University of Nebraska, Lincoln Nebraska. Journal of the American Veterinary Medical Ass. Sept. 1928, p. 637.

On March 12, 1928 an owner reported that he had lost 125 rabbits within 9 days. The owner stated that three or four days previous to the first death he had fed infertile eggs which had been incubated for 18 days. The eggs were fed raw by mixing them with a grain mash.

Bacteriological examinations proved that the rabbits died of *Salmonella pullorum* infection following the feeding of infertile, incubated eggs obtained from a commercial hatchery.

The Poultry Range may be dangerous by F. R. Beaudette. New Jersey Agriculture. New Brunswick, N. J., June 1928.

Descriptions of parasites. The range may or may not be safe, depending upon the efforts made to deal with the agencies which make it dangerous.

Death of Adult Birds by Bac. Pullorum by K. Jarmai. Allatorvosi Lapok 1927, No. 20, p. 245.

In 1921 Manninger showed the B. W. D. in Hungary. In 1927 this disease became of great importance. It attacked chickens and a year later full grown hens and cocks. The yokes of the eggs contained the *Bacilli-pullorum*.

Leucaemia in Poultry. Die Leukämie oder übertragbare Leukose der Hühner by O. Bang and C. W. Andersen. Festschrift Bernard Bang, Kopenhagen 1928.

Description of the histology of the normal organs and the morphology of the healthy blood of the hens and the symptoms of leucaemia. This work is fully explained by photos and drawings.

Conclusions: The disease is infectious. (2) The disease occurs as an acute disease with various haemorrhages and degenerative changes and as a chronic disease, which often reminds one of certain tumors (lymphoid sarcoms).

Combatting lice by Fluor Natrium. Zur Bekämpfung der Mallophagen (sog. Läuse) beim Huhn mit Natriumfluorid by H. Hartwigk. Vet. Hyg. Institut University Leipzig. Berliner tierärztliche Wochenschrift 10 Aug. 1928, p. 521.

Conclusions:

1. Owing to the parasites the feathers of the hens have an unhealthy appearance and the fowl are sensitive to all kinds of disease (Cholera).

2. One bath in a 0.5% solution of fluor-natrium frees the hens of the parasites.
3. Fluor Natrium is a vigorous and active remedy against feather-eating arachnoids and hexapodes.

Combatting Diphtheria with Hexa-Methylen-tetramin. Ausgezeichnete Heilerfolge mit Hexa-m. bei Geflügel-diphtherie bezw. Pocken by Dr. C. Cernaianu and T. Schlenker. Veterinär-bacteriologisches Laboratorium zu Chisinau (Rumenia).

Diphtheria and pox has been cured in all cases by hexa-methylen-tetramin in doses of 1 gram per Kilogram of the living weight. This must be repeated every 24 hours, by intramuscular injections of a 40 % solution in aqua destillata. The same favourable results were obtained with coryza avium contagiosa.

Vaccination against Diphtheria. Versuch über die Wirkung des Antidiphtherins gegenüber künstlicher und spontaner Infektion mit Hühnerdiphtherievirus by H. Wortmann. Dissertation, Leipzig 1928.

Liquid anti-diphtherin of Schreiber of Landsberg was used. Neither by cutane nor by intra venous injection did the serum provide sufficient protection against spontaneous infection with diphtheria. A case of diphtheria which had been cured already, broke out again after vaccination. Probably there are certain kinds of virus, which are not influenced by the vaccination. The vaccin had no effect on the virus used by the writer.

Tumors in Poultry. Drei Fälle von Geschwülsten beim Huhn by Dr. Fr. Karetta. Veterinärämlichen Untersuchungsstelle der Stadt Wien. Berliner tierärztliche Wochenschrift 1928. No. 34, p. 561.

The interest in tumours in hens, in connection with tumours in human beings, has increased considerably lately.

Description of: fibrosarcoma of the thorax of a hen, a cavernous angioma of the subcutis in the throat of a hen, a multiple round cell sarcoma of the skin of a hen.

Experiments to inoculate pigs with fowl tuberculosis. Versuche zur Uebertragung von Geflügeltuberkelbacterien auf Schweine. By Dr. Raebiger, Dr. Spiegl, Dr. Schmidt-Hoensdorf, Bakteriologisch Institut der Landwirtschaftskammer für die Provinz Sachsen in Halle a. S. Zeitschrift für Infektionskrankheiten, parasitairekrankheiten und Hygiene. Bd. 33, 1928 S. 35.

Fowl tuberculosis is very interesting as, besides occurring in birds, it also plays a part in the aetiology of tuberculosis of mammals, especially when the latter are still young.

American and Danish investigators have stated that the increase of tuberculosis among pigs is chiefly due to infection with fowl tuberculosis.

The writers have made tests with the infection of pigs. It appeared that the harm caused by fowl tuberculosis bacilli in pigs was not great and the pigs thrived in spite of local processes.

Infection of Poultry with Tuberculosis Bacilli of Mammals. Ein Beitrag zur Empfänglichkeit der Hühner und Tauben für Säugetiertuberkelbacillen. By Dr. Ruth Eber, Tierseucheninstitut der Universität Leipzig. Zeitschrift für Infektionskrankheiten, parasitaire Krankheiten und Hygiene. Bd. 33 1928, p. 59.

Results: No success has attended the attempts to infect hens with cultivated germs of human tuberculosis bacilli.

In a few cases slight infection occurred after injection of cattle tuberculosis bacilli.

Success was attained with subcutaneous injections, of fowl tuberculosis bacilli and also when this was introduced through the food.

Pigeons also remained immune from infection after receiving injections of human tuberculosis bacilli. In a few cases where cattle tuberculosis bacilli were administered, infection occurred. In cases where fowl tuberculosis bacilli were administered infection took place readily.

It is therefore apparent that hens and pigeons possess strong powers of resistance against mammal tuberculosis bacilli but on the other hand they are very susceptible to fowl tuberculosis bacilli.

Studies in Fowl-Typhoid by T. Komo. Fourth Report of the Government Institute for Veterinary Research Fusan, Chosen, Japan. 1927, p. 47-50.

Description of Fowl-Typhoid in Korea. The faeces are yellow-green, in cholera they are haemorrhagic. In the liver are found small white necrotic spots. The bacteria were found also in the marrow of the tibia. By serum treatment and vaccination the disease was controlled.

Poultry Diseases by John P. Rice. Head of Animal Diseases Section, Ministry of Agriculture. Northern Ireland. The Veterinary Journal. Sept. 1928, p. 446.

The World Poultry Congress at Ottawa commanded the attention of the whole civilised world. It was of special interest to veterinarians because 40 papers were presented on poultry diseases. The contribution of the British veterinary profession was one short paper, read by title, which dealt only with broad aspects.

In this article the author gives an explanation for the small part played by veterinarians in his country in avian practice and research.

The courses of instruction take little account of domesticated birds, the veterinarians leave their colleges largely ignorant of the magnitude of the poultry industry and its great losses. The duty of the veterinarians is to overcome this handicap.

GENERAL

List of Publications 1928. Dominion of Canada. Department of Agriculture, Ottawa. Pamphlet No. 90 — New Series.

The publications of the Dominion Department of Agriculture listed in this pamphlet are available for distribution. With the exception of those for which a price is set, they are free. Letters of application require no postage and should be addressed to the Publication Branch, Department of Agriculture, Ottawa.

A Poultry Survey in Kansas. By Loyal F. Payne and Howard H. Steup, Department of Poultry Husbandry. Bulletin 245. Kansas State Agric. College, Manhattan, Kansas.

A personal house-to-house visit was made to 250 different farms in ten representative counties in order to obtain an accurate cross section of the poultry industry in Kansas. The subjects upon which information was obtained included housing, incubation, brooding, management, feeding, breeding, diseases, marketing, and miscellaneous items. Tables giving the actual practices as carried out with each of these different subjects are listed and worked out on a percentage basis for each of five districts and for the entire state.

Fitting and Exhibiting Standard-bred Poultry. By H. H. Steup, Department of Poultry Husbandry. Circular 127. Kansas State Agric. College, Manhattan, Kansas.

This circular describes in detail the methods of selecting show birds from the common flock; how to prepare and train them for show-room competition; and how to care for them before and after the show. It also includes complete suggestions for the arrangement and management of poultry shows, as well as information on the organization of poultry clubs. The appendix contains a list of the more common defects of popular breeds of poultry and forms a valuable guide in the selection of breeding pens.

New Jersey Agriculture. Published Monthly at Rutgers University. To acquaint Jerseymen with the activities of their College of Agriculture. Agricultural Extension Service. Agricultural Experiment Station. Vol. X, No. 9. New Brunswick, N. J., September 1928.

Contents: Description with illustrations of the agricultural train. The exhibits in the Car for a better Poultry Industry are in charge of the State Department of Agriculture.

Morphology of the blood of the hen. Beiträge zur Blutmorphologie des Hühnes. By Dr. E. Breusch. Tierseucheninstitut der Universität Leipzig. Zeitschrift für Infektions-krankheiten, parasitaire Krankheiten und Hygiene. Bd. 33. 1928, p. 219.

The blood of hens differs in important points from that of mammals. The formation especially shows great differences.

The composition of the normal blood varies continually.

Pathological cell-forms seldom occur in the blood of healthy hens.

Sporotrichosis of Eggs. By J. Csontos. Közlemények az összehasonlító élet-és körtan köréből, 1927, t.xx, p. 160.

A sporotrich-germ, analog of that described by Beurmann, Matruchot and Ramond was found this winter in 20 % of the eggs on a market in Hungary. On another occasion this figure was no less than 50 %. This parasite forms round colonies on the inner surface of the shell and later on the inside of the membrane of the eggs. When examined they appear to be round black spots. The white of the egg undergoes a gelatinous decomposition. The spores penetrate the shell to the inside.

The freshness of eggs. (Zur Frage des Frische-Zustandes der Eier), by R. Haune. Archiv für Hygiene. Vol. 100, 1928, p. 9.

When held to the light a fresh egg should be absolutely clear, the yolk should not be visible either as a shadow or as a round ball. The air-room should be small. Further, the egg should be absolutely clean and the shell should have the natural fat-shine, which is of the greatest importance for maintaining the freshness of the egg.

Eggs that have been washed or dirty eggs must always be looked upon unfavourably.

How capons obtain and senile cocks regain male qualities by administering the serum of young male animals. (H. Busquet, Revue Vétérinaire, May 1928.)

According to A. Pezard capons obtained more or less the airs of a cock when testicle implantation takes place or when testicle extract is injected.

Busquet hit upon the idea that similar results might be obtained by administering the serum of young male animals and tests proved his theory to be correct.

5 c.c. serum of bulls, stallions and rams was administered per os to castrated cocks and worn out cocks on an empty stomach. In every case it was observed that after some time the birds began to crow, the comb changed colour, and the desire to fight returned. In some cases an inclination to tread also arose.

It was remarkable that the above mentioned changes soon appeared (i.e. after 14 days).

It will of course be quite easily understood that some time after the administration of the serum had been stopped the birds again returned to their old state.

The serum of bulls, stallions and rams appeared to leave quite the same effect in these experiments.

A Hen with two Vents by F. A. E. Crew, Director of Animal Research Dept., University of Edinburgh. The Veterinary Journal, London. July 1928, p. 363.

A Wyandotte hen showed two anal apertures, symmetrically placed one on either side of the midline. The perfectly normal eggs which the hen laid

invariably passed out of the left anus, whereas the faeces were invariably evacuated from the right one.

Post-mortem examination showed that the oviduct was completely normal and was peculiar only in that it did not communicate with a cloaca. The return was normal and into it opened the ureters and the orifice of the bursa Fabricii.

This case is of considerable interest to the comparative anatomist in that it demands a consideration of the nature of the interrelatedness of the down-growing Müllerian duct and the ingrowing of the anus.

Some Poultry Accounts by E. T. Brown. The Journal of the Ministry of Agriculture. London 1928, p. 256.

While poultry-keeping is known to be a profitable business it is extremely difficult to obtain particulars regarding actual profits. When obtainable, however, a poultry account makes interesting and instructive reading and much information may be derived from it.

The accounts appended do serve to indicate the profit that is made by average man who manages his fowls on business lines. The poultry accounts in question are those of a general farmer, a specialist breeder, a smallholder, a backyarder, a poultry-keeper specializing in ducks for laying and a man who caters for the demand in spring ducklings.

Plucking by Machinery. „Poultry keeping and Rabbit Breeding.”
Sept. 8, London.

The invention of a machine that will pluck poultry at a rate of somewhere about one per minute opens up a new field to the enterprise or rearers and fatteners. Probably very few people can dress a bird by hand in less than 10 minutes, and the operation is very tedious if not unpleasant. The machine, which was awarded a silver medal at the Royal Show at Nottingham, will not only draw the feathers and pens but bags them up; it requires mechanical power to work and only costs about £40, plus another £5 or so for a little driving engine. As, now-a-days, practically everything can be purchased on the deferred payment system, a plant of this description is within the reach of many utility poultry-keepers, and will enable them to sell direct to retail shops instead of to hawksters.

Artificial Lights for Late Hatched Leghorn Pullets by R. T. Parkhurst, Director National Institute of Poultry Husbandry. Newport. Salop, England.

Conclusions:

1. Under the conditions of the experiment, late hatched (May) pullets proved profitable. Due to the relatively small size of eggs they produced, however, their value is considerably below earlier hatched pullets for winter production of standard eggs.
2. The pullets given lights responded to artificial illumination especially in the winter period, and gave better production and profit over feed and lighting costs than the unlighted pullets.
3. The experiment proved that satisfactory in expensive devices may be arranged for automatic regulation of the lights.
4. A reasonable allowance of artificial illumination did not injure the health of the birds. There was no ill health or excessive mortality.
5. The body weight increased very materially during the experiment, but especially during the lighting period.
6. Food consumption is materially increased by the use of lights.

7. Estimating the cost of electricity at 7d. per unit the cost of lighting was 2d. per bird. The margin of income over the combined feed and lighting costs was 14s. 6.4d. per bird in the lighted pen, 1s. 8.4d. per bird more for the 48-week period than the margin of income over feed cost in the unlighted pen.

The National Institute of Poultry Husbandry, Newport. Salop. By Raymond T. Parkhurst, B.Sc., (Agr.) M.Sc., Director.

A National Centre for Advanced Instructional and Experimental Work in Poultry and Rabbit Husbandry. A description with illustrations of the Nat. Institute.

Progres. Report. Published weekly by John E. Ivey, Supervisor, M. V. Lowder, Superintendent; G. A. Trollope, Poultry Specialist; H. R. Bailey, Poultry Specialist.

To Poultrymen, Extension Workers, and Others interested in Poultry Development:

This is a progress report of the state-wide egg laying demonstration which is now under way at Auburn. It is being conducted by poultrymen, county agents, home demonstration agents, poultry specialists, and many others who are interested in developing a bigger and more profitable poultry business. The objects are to stimulate a greater interest in economic poultry production and to impress on the minds of the people the value of proper housing, feeding, breeding, and management of poultry.

The printed reports of the Fourth Alabama National Egg Laying Contest will only carry the number of eggs produced for the week and the number to date. Each contestant will receive a weekly pen record of the eggs produced by the birds in their particular pen. If anyone is interested in the egg weights of any particular pen he may get this information by writing to the Supervisor of the Contest.

Origin of the fawn and white colouring in Ducks. (Die Scheckung beim Wassergeflügel). Geflügel-Börse. Leipzig, 13 Juli 1928.

Illustrated article which gives interesting facts on the origin of the different white coloured fields in the fawn and white Indian Runner duck and the Mappie duck. Their white fields are developing on the places where in the wild-coloured ducks the feathers are of a brighter colour.

INTERNATIONAL REVIEW OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE
WORLD'S POULTRY SCIENCE
ASSOCIATION

300.000 MEMBERS

EDITOR:
Dr. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

To the Reader.

The Editor wishes to express his hearty thanks

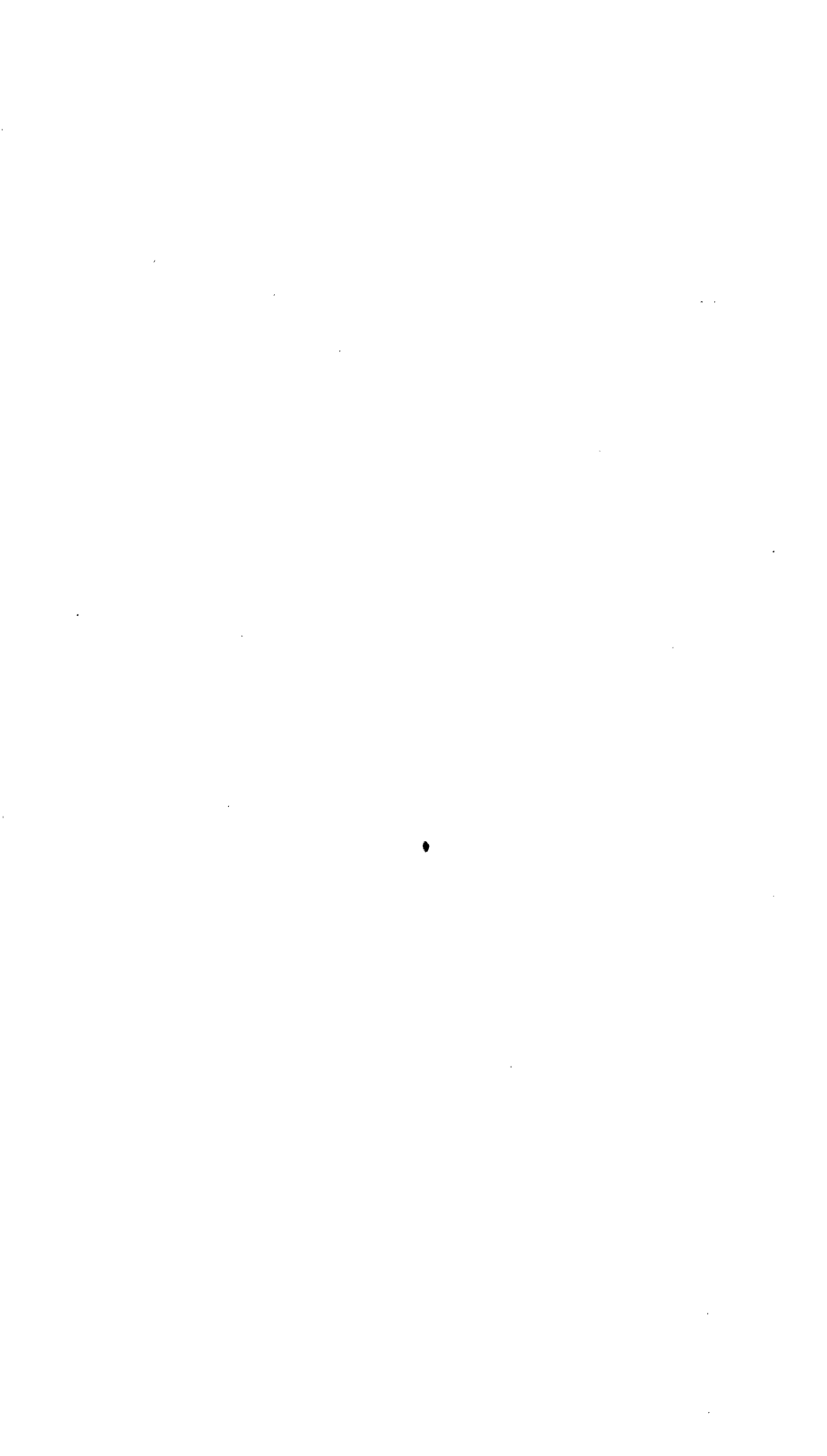


for the friendly wishes relative to the New-Year, and offers his best wishes in return to the readers for the year 1929. May this year be a successful one for the Int. Association and may the International Coope-

ration become still more confraternal.

All applications and communications respecting **membership of residents in Great Britain and Ireland**, should be addressed to **Dr. Edward Brown, F. L. S.** Honorary Past President, whose address is 60, Castellain Mansions, London, W.9, England. He has undertaken this duty and it will facilitate registration if that plan is adopted. **Other communications from Continental European Countries** should be addressed to **Dr. te Hennepe, Diergaardesingel 96a, Rotterdam, Holland.**

THE EDITOR.



TO THE ASSOCIATION MEMBERSHIP.

Ithaca. N.Y., U.S.A., December 15, 1928.

The Revision Committee appointed at Ottawa has been working on the revision of the Constitution and By-laws. One of the changes will be in connection with the name of the Association. The name that seemed to have the most support was „**The World's Poultry Science Association**”.

The Congress headquarters in London desired to use this shorter name in publicity connected with the next Congress. It was, therefore, taken up with members of the Council and decided that the new name would be tentatively adopted and used, though of course technically it will need to be approved by the Association in the regular manner.

This information is given you at the present time so that you will not be confused by receiving information under that name.

In due time you will be given the opportunity to ratify the recommended changes.

Very truly yours,

G. F. HEUSER.

PRESIDENT'S REPORT

OF HIS FIRST YEAR'S WORK

A very brief presidential report of his first year's work will be given here. In the first place let me say that it was not always easy to measure up to the standards set by my predecessor, on the other hand the foundations were so well laid by him that it made it much easier to carry on. The assistance and fullest co-operation given at all times by Dr. Brown were a source of satisfaction and help and I want to express my appreciation of them. Further co-operation I received from all was most gratifying and made possible any work that may have been accomplished.

Sectional Council Meetings.

During the year there were three sectional council meetings held, 1. Purdue University, U.S.A., August 23, at the time of the meeting of the Poultry Science Association; 2. London, England, September 13, when the first meetings of the 1930 Congress were called; 3. Hanover, Germany, October 27, during the Poultry Show and at the time of the President's North European visit. At all of these council meetings the immediate needs of the International Association and the 1930 Congress were the chief items of business.

In London, the committee charged with the revision of the constitution, met under the chairman Dr. Brown. A report of this will be given elsewhere in this issue of the Review.

The Change in Name.

For sometime there has been a feeling that the name of this Association was too cumbersome and did not convey the correct application. The question was discussed at the Purdue Council meeting and the suggestion was made that the name be changed to „the International Association for the Advancement of Poultry Science". This was not favored at the London meeting and the name „World's Poultry Science Association" was preferred. As the London meeting had eight countries represented the name „**World's Poultry Science Association**" was submitted to the members of

council in America, from whom only one member took exception to the name. It was therefore considered as being adopted and is being used by the 1930 Congress Committee, though, of course, the action of the executive will require approval by the Association in 1930.

The Extended Membership.

In the effort for new members it was found that the very limited qualification debarred many who would make desirable members. The Sectional Council meetings therefore decided with the change of name that individual membership should be greatly enlarged. This is provided for in the amendments suggested in the constitution. Accordingly members are being taken now upon the new basis.

Affiliated associations also are being accepted according to the amended constitution. These amendments will have to be approved but they were so vital to the development of the Association that the executive decided to act at once.

Affiliated Associations pay £ 5 per annum.

President's Visit.

A full report of his visit is included in this issue. I hope all members will read it, also copy of a letter giving the substance of business taken up during the official interviews with the Ministers of Agriculture in the countries visited. I would like here to emphasize my appreciation for the courteous hearing that was afforded in each of the countries visited. At present it is the intention to visit the remaining countries of Europe and possibly several others. In the 1929 visit I hope to have not only those who accompanied me this year but representatives from several other countries as well.

The 1930 Congress.

There need be no doubt in the mind of any person as to the magnitude of the next triennial Congress. After my visit to London I can assure every person that the event will be such that it will be a credit to the country that is staging the Congress, to the Association, and to the Congresses which have preceded it. The announcements will soon be out as the dates and the place

of meeting are already set, — July 22 to 30 in the Crystal Palace, in London.

No pains have been spared in the arrangements that are being made and the best men available have been named as officers. With Sir Charles Howel Thomas as Chairman of the National Committee, Percy Francis as General Director, and Dr. Wilkins as Secretary, and with the splendid men in charge of their committees as well as members of the various committees, England has an organisation that will insure the success of our 1930 Congress.

Post Congress Tour.

In order to meet the request of people from so many different countries, and especially from America, very attractive Post Congress Tours are being arranged that will make it possible for those coming from any country to see things of interest in the British Isles and in the nearby continental countries. Full details of these tours will be given in plenty of time and the price will be kept extremely low compared with the service, so that it will be possible for a great number to participate.

In closing this very meagre report, let me say that I have enjoyed the year's work exceedingly. The whole hearted co-operation of the members has been an inspiration. The International correspondence has strengthened old friendships and made many new ones. The visit to so many countries during the year has done much to extend that world fellowship for which our Association stands. **The experiences of the year have convinced me more than ever that the Association has a distinct place both in world poultry culture and in the furnishing of international good will.** We will look forward to the 1930 Congress, which will be an indication that we are doing our part in both of these spheres.

F. C. ELFORD,
President.

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**REPORT OF A VISIT TO EUROPEAN COUNTRIES MADE
ON BEHALF OF THE INTERNATIONAL ASSOCIATION
AND THE FOURTH WORLD'S POULTRY CONGRESS,
1930, BY THE PRESIDENT, F. C. ELFORD.**

(The intention of the visit was to present to the Ministers of
Agriculture the advantages to them of the Association, and
participation in the 1930 Congress.)

The visit to the British Isles was made by the President; to the nine continental countries he was accompanied by Dr. B. J. C. te Hennepe, Secretary of the Association for the Continent of Europe; to France, Belgium, Holland and Germany, by Professor Salvador Castello, First Vice-President for the continent of Europe, and to Holland, Denmark, Sweden, Finland, Latvia, Poland and Germany by Mr. J. P. Mc. Clelland of the Canadian National Railways, London.

The preparation, for this visit was made by an official letter from the British Foreign Office to the British Embassy in each country, the request for which was presented by the Canadian High Commissioner in London. These letters paved the way for the official visits with the interested officers in each country and expedited the business of the trip in every way.

England.

Arrangements for the Congress were well under way, with Sir Charles Howel Thomas, Permanent Secretary to the Ministry of Agriculture and Chairman of the Congress Committee, Mr. P. Francis, Congress Director and Dr. V. Wilkins, Secretary, also a number of Congress committees were already formed. The initial meeting of the Congress Executive and Finance Committee met at the Crystal Palace September 13th, the same time as the European International Council met. All were entertained by the ministry to luncheon which was presided over by Sir Charles Howel Thomas.

During my stay in London a number of meetings were held with the Congress Officials including the Chairman Sir Charles Howel Thomas. The Chairman is most enthusiastic concerning the

Congress and I can assure the members that the 1930 Triennial Meeting will be worthy of the Association and the country that is holding it.

Before leaving England, Premier Baldwin very graciously granted me an interview when he assured me that no pains would be spared to make the Fourth Congress a worthy successor to those that had preceded it.

Irish Free State, Dublin.

The Minister of Agriculture, Mr. Hogan, expressed himself as most interested in the work of the International Association, and the Fourth World's Poultry Congress, to be held in London, 1930, and intimated that the Irish Free State would co-operate to the fullest extent with both and further would be pleased to have the Congress delegates visit the Free State in the Post Congress Tour.

The visit to the Minister was made in company with Dr. H. Hinchcliffe, Director of Livestock work, Mr. Pendergast, Chief Inspector, and Miss Hennerty, Chief Poultry Inspector for the Ministry. During the stay in Dublin, Dr. Hinchcliffe and Miss Hennerty were good enough to show me many places of interest including private poultry farms and a government poultry station.

North Ireland, Belfast.

I was met here by Mr. Sidney Smith, Chief Inspector for the Ministry, and taken to Mr. I. V. Coyle, Assistant Secretary for Agriculture. (The Minister, and Dr. Gordon, both were out of the city.) Here I met also Dr. Scott Robertson, Chief Inspector for the Ministry.

These officers assured me that North Ireland would give every support possible to the International Association, and to the 1930 Congress, and also would be pleased to arrange for two days of the Post Congress Tour.

Scotland.

At Edinburgh, along with Mr. Alex Main, I met Sir Robert Greig, Chairman of the Scottish Board of Agriculture. Sir Robert expressed his appreciation of the work of the International Association, and especially of the importance of the Congress held in Canada in 1927. He assured me of the hearty support of Scotland in the International Association, and its co-operation in the 1930 Congress also in the arrangement of the Post Congress Tour through Scotland.

Paris, France.

The detail of the arrangements in Paris were made through Professor Voitellier, Vice-President of the International Association. With Professor Voitellier we, (Professor Castello and Dr. te Hennepe joined me here), visited the office of the Minister and had an interview with the Minister's Secretary, and the Director General of Agriculture, the Minister himself being absent.

The invitation from England had not, unfortunately, been received by the Ministry of Agriculture, and therefore only tentative opinions could be offered, but we were assured that France would contribute to the Congress and to the International Association in any way suggested.

An afternoon meeting had been arranged by Professor Voitellier with the Directors of the Council of the French Associations for Poultry Culture, at which meeting we received a very hearty reception. The reasons for our visit were explained by Professor Voitellier, Senor Castello, and Dr. te Hennepe, with a very short talk in English by myself. The Association gave us every assurance that they would favour the fullest co-operation.

Brussels, Belgium.

The British Embassy had arranged for the meeting and we met the Minister of Agriculture, Mr. Baels, and members of his staff, special mention being made of Mr. Warnants. (Professors Frateur and Maenhout unfortunately were in Rome.)

The Minister himself expressed keen interest in the Association and the 1930 Congress, and assured us that Belgium would be represented and would participate in every way possible, also that he himself would be present either as Minister or ex-Minister.

The Hague, Holland.

Owing to the enthusiastic reception given by the Ministry and the Congress Committee we were unable to call upon the Embassy as usual, but arrangements were so complete that nothing was left undone. First we had the pleasure of meeting the Minister himself, Dr. Kan, who was extremely sympathetic to the work, and who had been good enough to provide the means for Dr. te Hennepe to accompany me to the continental places visited.

The members of the committee with Mr. Wilton as Chairman, and Mr. Kakebeeke also present, were already convened when we arrived. The Committee listened to the outline of the work

of the International Association and what was hoped for the 1930 Congress. In reply we were assured by Mr. Wilton that Holland was in sympathy with the work of the International Association and would immediately take up the question of the 1930 Congress Committee, affiliation with the International Association of local Poultry Associations, the national Patron to the International Association, and further contribution from Holland. Further assistance was also promised in outlining that part of a Post-Convention tour which would be spent in Holland. This let it be noted, was also discussed in France and Belgium.

An official Banquet was tendered at the Hague, with Mr. Wilton and Baron Van Heemstra, as hosts. At the function besides the hosts and the delegation were, I. G. J. Kakebeeke, J. G. Tukker, Prof. Dr. L. de Blieck, Dr. T. F. E. Claringbould, P. H. Burgers, C. S. T. van Gink and J. Mantel.

Upon leaving Holland Professor Castello returned to Brussels, and Mr. Mc. Clelland of London, England, joined the deputation.

Copenhagen, Denmark.

Upon arrival we were met at the station by Vice-President Kock. Next morning we called at the British Embassy and found that, as it was Saturday morning, and the Minister of Agriculture was also the Premier of the country, the interview had been arranged for the following week. However, as this was impossible since we were due in Stockholm on the Monday, upon request of the Embassy the Premier, Mr. Madsen-Migdal, very kindly agreed to receive us at once.

Accompanied by Professor Kock, and the Acting British Ambassador, we visited the Premier and presented the case for the International Association and the 1930 Congress, and found a very sympathetic atmosphere. The Premier assured us that Denmark would participate in the Congress, and that he would be very glad to consider the other claims put forth on behalf of the Association if the President would later submit the various items that had been discussed. It may be mentioned that this had been asked for by most of the countries visited, and accordingly a letter will be sent to each one upon my return to Ottawa. A copy also being sent to the Ambassadors of the various countries concerned.

The Premier further suggested that we should meet the representatives of the National Poultry organizations. The details of this appointment were arranged by Professor Kock, and we met

Dr. Traberg, President of the Danish Co-operative Poultry Association, and Mr. Knudsen, Assistant Secretary of the Agricultural Council of Denmark. The meeting was preceded by a dinner given through the courtesy of Madame and Professor Kock, at their residence.

Professor Kock explained to the representatives of these two organizations the work of the International Association and the Congresses. In reply both bespoke the heartiest co-operation of their respective Societies.

During the conversation the question of further representation for Denmark on the International Directorate was discussed, and Dr. Traberg's name was suggested as a second member of the Council. At this juncture the advisability of holding a Sectional Directors meeting in Hanover at the time of the Jung-Geflügel-Schau was considered, and immediately afterwards notices of the meeting were sent out.

Stockholm, Sweden.

Here the British Embassy intimated that it was impossible, owing to local celebrations, for the Ministry to meet us on the Monday, but that arrangements had been made to have interested heads of Departments and Associations meet us at 12 o'clock on Tuesday. As, however, we expected to meet the Minister in Helsingfors on the Wednesday it was necessary to divide forces in order to meet the Ministry in Sweden on Tuesday and in Finland on Wednesday. Therefore, Dr. te Hennepe left upon the previously arranged date, while Mr. Mc. Clelland and I remained in Stockholm for the meeting on Tuesday.

We met a very representative body composed of Mr. Insulander, Director General of the Agricultural Board, Mr. Berglov, State Secretary of the Agricultural Department, Mr. Halling, President of the Poultry Associations of Sweden, Professor Nils Hanson of the Central School of Agriculture and Experiments, Mr. Lekander, Secretary to the Minister of Agriculture, in the absence of the Minister himself.

The International Association including the Congresses were not very well known in Sweden. However we had the assurance that Sweden would consider participating in the 1930 Congress, and the various questions relating to the International Association would receive consideration upon the receipt of the letter outlining the various points taken up at the interview.

Helsingfors, Finland.

Dr. te Hennepe visited the British Ambassador, Dr. Cowan, who personally accompanied him to the Minister of Agriculture, Mr. Mattiesen. Here also it was discovered that the officials of Finland were not acquainted with the Association, and knew comparatively little concerning the work of the Congresses.

The Minister introduced Dr. te Hennepe to an official of the Department who discussed with him the questions which were being submitted to the various Ministries, and further the Minister suggested that it would be well to visit the Government Experiment Station at Ruhimaki, where some officers interested in this particular work would be found and who were expecting to meet the delegates on Thursday. Owing to the necessity of leaving Helsingfors on Thursday morning at 10 o'clock in order to reach Riga for an appointment on Saturday morning this was impossible.

The Hon. Mr. Mattiesen stated that Finland would have a peculiar interest in the exhibit at the Congress because of the fact that they were looking for good breeding stock in order to breed up their own poultry. Further, the Deputy Minister, Dr. Jutila, asked for another interview where International matters were discussed to some extent, and during this interview Dr. Jutila gave the interesting information that Finland had a White Leghorn hen living on a poultry farm just within the arctic circle which had laid in one year 329 eggs.

Riga, Latvia.

Here as usual the British Embassy arranged for an interview with the Minister of Agriculture, Mr. Gulbis, who very graciously met us, and was much interested with the work both of the International Association and the 1930 Congress, and promised that Latvia would consider both. Hon. Mr. Gulbis then introduced two other officials who conducted us to a meeting of the executive council of the Agricultural Associations, presided over by Professor Lejins, President of the Central Council of the Latvian Animal Breeding Society, who is also director of the Government Experimental Farm and director of poultry work for Latvia. The Minister, Mr. Gulbis, had already intimated that Professor Lejins, after discussing the questions with us, would advise with him as to what programme Latvia should adopt.

We then met Professor Lejins and his Executive, and he promised that the whole subject would be discussed in the next meeting of the Executive, after which they would suggest to the Minister what Latvia ought to do.

Professor Lejins also stated that he would first like to read the International Review, copies of which Dr. te Hennepe left with him, as had been left at each place visited. The following day we visited the Experimental Station of which Prof. Lejins is Director.

Warsaw, Poland.

The British Embassy directed us to a meeting of the Central Executive of the Poland Poultry Breeders Associations, who were convened for the purpose of receiving us. At this meeting we found the President of the Confederation, Professor Trybulski, through whom we met Baroness Kosinska, President of the National Humane Society; Miss Irene Zablocka, Instructress for the Confederation, Mr. Albin Zacharski, Secretary of Council, Mr. M. Decowski, President of the Co-operative Egg Association, Mr. E. O. Kutzleb, Mr. J. von Heinrich and others. A most enthusiastic company, who gave us a wonderful reception and showed us every courtesy including a banquet and the seeing of a number of poultry plants, a girls school, and the Association's breeding station, also a visit to the Central Collecting and Grading Station of the Confederated Societies of Poland.

We had an interview the next day with the Minister of Agriculture, the Hon. T. Kossakowski, who was exceedingly gracious and said Poland would co-operate in the International Association and in the Congress.

Berlin, Germany.

We were met at the hotel by Professor Dr. Schachtzabel, who intimated that we were to see the Minister at noon. Consequently we met the Hon. Mr. Dietrich who had with him Mr. Kurschner, Chief Poultry Adviser. The Minister was good enough to say that Germany would co-operate in the International work and certainly would be present at the Fourth World's Poultry Congress.

In the evening we were honoured by an official reception in the form of a banquet, tendered by the Federated Association of Poultry Breeders, presided over by Baron Von Wachendorf of the Foreign Office. Among others present were Mr. Kurschner, Dr. Koehler and Dr. Gerriets, of the Ministry, Dr. Von Burgsdorff, Dr. Roemer, Dr. Weinmiller, Prof. Dr. Miessner, Prof. Dr. Raebiger, Dr. Beller, Prof. Dr. B. Durigen, Dr. Engel and Wife, Prof. Dr. Schachtzabel and Dr. O. Keiser.

One day was spent at Halle, Cröllwitz, visiting the Poultry Institute of which Prof. R. Römer is the efficient and courteous Director. Two days at Hanover visiting the young bird show and being present at the Annual meetings of the National Poultry Club, and of the Federated Societies.

While at Hanover a meeting was called of the European members of Council, where Germany, Denmark, Holland and Spain were represented. At the meeting it was reported that three applications for affiliation had been received, the Danish Co-operative Poultry Association, with 14000 members, through the President, Dr. Traberg, who was present, the Poland Federated Associations with 30.000 members, through Prof. Trybulski, President, and the Federated Societies of Poultry Breeders of Germany with 135.000 members, through Prof. S. Schachtzabel.

The Directors expressed their approval of the international visit and strongly urged that it be continued next year, until all countries of Europe be visited and if possible Egypt, Palestine and South America also be visited before the 1930 Congress.

Apparent Results of the Visit.

The countries that had been represented in the International Association and had participated in the Congresses assured us that their interest now would be keener than ever, and the countries that had not known of the Association nor the Congresses intimated that the visit was greatly appreciated and would ensure their country's participation, if not immediately then certainly in the very near future. Further that since the visit had been made any correspondence relating to the work of the Association would receive more intimated and immediate attention.

In all countries we found considerable satisfaction from the information that the membership of the Association had been enlarged. It was found that previously possibly only one person in the whole country was eligible for membership, and we were assured on every hand that now many members might be expected from most of the countries. Further, the possibility of affiliation on the part of Associations was received with enthusiasm, and I think we can look forward to the near future when, through our affiliated Associations, we will have a membership of half a million.

If assurance were required it has been received in practically

every country that the International Review is one of the strong features of the International Association. On every hand where the Review had been received nothing but the highest praise was given, and where it had not been received a strong request was made that copies should be sent.

The Post Congress Tour.

A most interesting Post Congress Tour is being arranged and will be available to delegates from all countries. The detail of which will be given later. The trip will extend over four weeks and will in England include Cambridge, Stratford-on-Avon, Harper Adams College, Chester, Lancashire, Windermere, etc.; In Scotland, Edinburgh, the Trossachs and Glasgow; North Ireland, Belfast and the Giant's Causeway; South Ireland, Dublin, Cork and Blarney Castle and the Lakes of Killarney. Then back over the Irish Sea through Wales to London. In all about two weeks in the British Isles.

From London to Paris by train and boat, three days in and around Paris, then through the battlefields to Brussels and Belgium then on to Holland where the Hague, Amsterdam and other places of interest, will be seen before going into Germany, there visits will be made to Hamburg, Berlin, Munich etc., then about three days in Switzerland. Denmark or the Passion Play at Oberammergau may be visited as a substitute for two or more days of the Continental trip. In place of the Continental trip as noted above a trip from Paris to Spain may be taken.

It is expected that the major part of this tour will be taken by motor busses and in each country official receptions will be tendered the delegates. The price will be extremely low for the class of tour. Particulars will be available at an early date.

Appreciations.

In closing this brief report I would like to take the opportunity of expressing my thanks to Professor Castello for his presence in France, Belgium, Holland and Germany, and to Dr. te Hennepe for his presence throughout the continental trip. Without him and his knowledge of so many languages the visit never could have been as successful as I believe it was. Further to the Cana-

dian National Railways for sending Mr. Mc. Clelland with the deputation through all continental countries except France and Belgium. At these countries Mr. Mc. Clelland represented England upon the deputation, and was of great help in securing proper transportation and hotel facilities. Again let me express my appreciation of the way in which the various countries, through their Ministers of Agriculture, received the deputation, and to the British Ambassadors for their assistance in arranging the interviews.

F. C. ELFORD,
President.

INTERNATIONAL ASSOCIATION AND WORLD'S POULTRY CONGRESS.

The following is the detail covering the substance of an interview made by the President of the International Association of Poultry Instructors and Investigators, F. C. Elford and other Officers of the International Association to the Ministers of Agriculture in the Irish Free State, North Ireland, Scotland, France, Belgium, Holland, Denmark, Sweden, Finland, Latvia, Poland and Germany, also England.

Most of the Ministers or those interviewed, asked for this letter consequently it is being sent to all who so kindly met the President and those who were with him.

The full text of the subjects are herewith given though in some cases the complete list may not have been taken up in the interview.

Dear Sir:

Following the visit made by myself and other officers of the International Association, I am taking the liberty of writing you so as to bring before you in detail the matters discussed at this interview. I will number the various paragraphs so as to bring the items out more clearly.

1. **1930 CONGRESS & EXHIBITION.** Your country has received an invitation from London, England, to participate in the Fourth World's Poultry Congress and Exhibition, which will take place in London, July 22nd. to 30th, 1930. It is earnestly hoped that this invitation will be accepted and that you will participate through any or all of the following mediums.

a. **National Exhibit.** This would include an educational or trade exhibit, illustrating the Poultry work in your country and the nature of the products which you have for export. A live bird exhibit demonstrating the types of poultry you have. This live bird exhibit might include Chickens, Ducks, Geese, Turkeys, Rabbits, Cavies and Pigeons.

b. **Trade Exhibits.** There will be an opportunity for each country to exhibit through its Trade Department or

otherwise, Poultry Appliances, feeds, etc.

- c. **Participation in the Programme.** Papers dealing with the industry from your national standpoint. These must go through your National Congress Committee and be submitted to the Congress Executive in London.
- d. **Delegates.** It is earnestly hoped that a number of delegates, official and otherwise, will be sent from your country. The opportunity which the Congress presents is outstanding in that delegates from so many countries of the world will be present. It is therefore hoped that your highest Government officials, your poultry officials, and many of your leading citizens and poultrymen will attend the Congress.
- e. **The Appointment of a National Congress Committee by your Department.** This Committee is for the purpose of handling your participation in the International Congress, including exhibits and papers presented at the Sessions. Through the Chairman of this Committee, the Executive of the Congress Committee in London will function.

2. **THE INTERNATIONAL ASSOCIATION.** There were several questions concerning this Association that we would like to have you consider, they are:

- a. **Members of Council.** The appointment upon the International Directorate of your full quota of members. Each country is entitled to three members nominated by the country itself.
- b. **Patrons of the International Association.** In order to have the interest of each country fully established a patronage list is provided whereby a country can become a Patron by the payment of £ 5 —five pounds — or its equivalent.
- c. **Further National Contributions.** In order to secure sufficient finances it will be necessary for many countries to contribute over and above the amount required as Patrons. It is earnestly hoped that your country will see its way clear to make an annual contribution to the International Association. Without doubt the activities of the International Association, of which the triennial Con-

gresses may be considered the major activity, have established the justification for such contributions.

- d. **The International Review.** This official organ of the Association is issued four times a year, and contains the only official world record of publications by the Poultry Industry. This is sent to all Patrons, to affiliated Associations, and to individual members. It would be an advantage to have this Review placed in all Departmental and other Libraries in your country. The Editor of the Review is Dr. te Hennepe, State Serum Institute, Rotterdam, Holland.
- e. **Membership.** The membership of the Association has been broadened in that it will comprise:
 1. **Individual membership,** in which any person interested is eligible, Membership fee is one pound or its equivalent.
 2. **Affiliated Associations.** National Associations may affiliate upon the payment of five pounds or its equivalent. This provides five copies of the International Review from which translations and quotations may be made for National publications.
 3. **Patrons.** Any country is entitled to become a Patron by the annual payment of five pounds, which entitles the country to the receipt of five copies of the Review to be sent to one or more addresses.
- f. **Executive Meetings.** Occasionally, outside the triennial Congresses and in connection with important exhibitions or meetings, there will be called Sectional Executive meetings at a number of which it is hoped each country will be represented.

These briefly are the points which were discussed in the interview you were so kind to grant, and they are compiled and sent to you in this communication in order to make the items clear, and as already noted, because of the request of a number of the countries.

On behalf of the International Association let me thank you again for the courtesy in granting the interview, and for the

encouragement which you have already given, and may I look for a communication intimating what further coöperation your country may be disposed to contribute.

Yours faithfully,

F. C. ELFORD,
President.

SECTIONAL COUNCIL MEETING, OCTOBER 27.

Hannover, Hotel Luisenhof.

Present: Elford, Canada; Castello, Spain; Kock, Traberg, Denmark; Schachtzabel, Roemer, Weinmiller, Germany; te Hennepe, Holland.

1. The President opened the meeting and introduced as a new member of Council Dr. Traberg of Denmark and expressed the pleasure all felt in welcoming him to the council and to this meeting.

2. The President then gave a description of the trip through North Europe. He had hoped Mr. Francis, Director of 1930 Congress, would have been present to day to give the last information about the Congress in England, unfortunately Mr. Francis could not leave London because of important meetings. The President expressed the hope that during his term of office the finances of the Association might be put upon a basis that would ensure adequate funds to carry on. For though Canada had allowed him a free hand, to perform his Presidential duties, the next President might not be so favourably situated.

This was the first time he thought that ambassadors had taken an interest in the poultry industry. The British Embassies were deeply interested in our work and were co-operating fully with the foreign offices and the Ministers of Agriculture in the countries visited. A report of this trip will be sent to all the Ministries and to the Ambassadors.

3. Re the cost of Dr. te Hennepe's trip, Holland was paying a proportion but the President felt that Dr. te Hennepe should go the whole trip consequently there is an excess of 200 dollars that will have to be met. If all other mediums fail, then the Association will pay as soon as it has the funds.

4. The President hoped that within a short time the Association would have sufficient members to have the International Review printed in more languages. During the trip three National Associations affiliated: viz.

Deutscher Bund	140,000 members
Denmark	14,000 ,,
Poland	30,000 ,,

5. Dr. Traberg thanked the President for the cordial words of welcome to the council meeting and said that he thought it was of high value that the President and Secretary had visit different places in North Europe. After the discussion following on this point, the council recorded its hearty approval of this trip and urged that the rest of Europe at least be visited next year.

6. Prof. Castello explained the operation of the „Federation internationale d'Aviculture". He said only societies can be members. Every society pays 200 francs a year. There is a yearly meeting in Paris.

The council expressed a desire to wait for more information before taking action.

It was intimated that the place and date of the next sectional meeting of Europe would be called for Paris, during the International Exhibition in February, 1929.

Dr. TE HENNEPE,
Secretary for Continental Europe.

29

THE WORLD'S POULTRY SCIENCE ASSOCIATION
1929.
MORE THAN 300.000 MEMBERS.

Patrons.

Countries enrolled as Patrons 8

Membership.

Individual Members 222

Affiliated Members 286500

Total Membership . . . 286722

INDIVIDUAL MEMBERS.

	1929	1928	Increased with
Australia	1	1	—
Belgium	1	1	—
Burma	2	2	—
Bermuda	1	1	—
Canada	28	17	11
Cuba	3	1	2
Czecho-Slovakia	1	1	—
Denmark	3	1	2
Egypt	2	1	1
England	34	26	8
France	2	2	—
Germany	18	5	13
Greece	1	0	1
Holland	16	9	7
India	5	2	3
Ireland	10	9	1
Italy	1	1	—
Japan	1	1	—
Lettvia	1	0	1
Norway	2	2	—
Netherlands-East-India	1	0	1
New-Zealand	1	1	—
Palestine	1	1	—
Poland	4	2	2
Russia	1	1	—
Scotland	26	8	18
South-Africa	5	3	2
Spain	1	1	—
Switzerland	2	0	2
United States of America	42	36	6
Wales	5	3	2
	222	139	83 = 60%

Affiliated Members.

Canada	500
Denmark	14.000
England	
France	
Germany	140.000
Poland	30.000
United States	102.000
	<hr/>
	286 500

**The International Review of Poultry Science is exchanged with
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South Australian Government, (Address) Agent General of South Australia, Australia House, Strand, London, England.

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Danmarks Tjerkroavler Forening, Vodroffsvej 9, Copenhagen.

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Związek Spółdzielni Mleczarskich i Jajczarskich ul. Hoza no. 51, Warsaw.

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BREEDING

The First Year Egg Production of Barred Plymouth Rocks by V. S. Asmundson, University of British Columbia, Vancouver. Scientific Agriculture, Vol. IX., No. 2, 1928.

In this study of 569 records of first year production it was found that average production had increased by nearly twenty eggs or from 187 eggs in 1920—21 to 206 in 1925—26. The mean annual egg production of the 569 birds was 198 eggs which was practically identical with the average for Barred Rock pullets entered in the British Columbia contests.

The egg production was lowest in November and highest in April. The lower production in certain months was found to be partly due to the number of birds that did not lay during these months as compared with the number of such zero producers in other months. Reduction in periods of non-production was shown to be partly responsible for increases in egg production particularly in January and February.

Variability in annual egg production did not change. Variability in monthly egg production was least in the spring months of March, April and May, and greatest in the winter months (November to February) in October.

Record of Performance and Registration by M. A. Yull. Bureau of Animal Industry, U.S. Dep. of Agriculture. Poultry Science 1928, p. 132.

This outline of the minimum requirements for Record of Performance and Registration are to be regarded as tentative suggestions for the consideration of the poultry industry.

The Method of Awarding Prizes at Exhibitions of Utility Poultry in Germany by Dr. Weinmiller, Erding-München, Bavaria. Poultry Science, 1928, p. 139.

Polish Greenfoot Hens by Maurice Trybulski, Edited by the Central Committee for Poultry Breeding in Poland. Warsaw. 30 Kopernika Street 1927.

Illustrated description of the history and characteristic features of the Polish Green-foot Hens, a very economical Polish breed.

The economic value of caponising in Germany. Die Volkswirtschaftliche Bedeutung der Kastration der Hähne by Dr. S. Dreifuß, Friesenheim, Baden. Tierärztliche Rundschau 1928, p. 834.

Conclusions:

1. Up to the present caponising has not been practised to any great extent.
2. In spite of the favourable results it is not recommenable to breed poultry intended for consumption. The import of eggs is of more importance than the import of poultry for consumption.

3. If, every year, the cocks not needed for breeding purposes are castrated, it will be found that there are sufficient to supply the demand for consumption.
4. Veterinary surgeons should teach suitable persons in all places how to perform the operation.

Caponising. Zur Technik des Kapaunisierens der Junghähne by Dr. S. Dreifus, Friesenheim, Baden. Tierärztliche Rundschau, 1928, p. 811.

Conclusions:

The testicles are situated about the height of the last inter-costal cavity, cranially & ventral of the kidneys, on each side of the vertebrae.

It is not wise to caponize cocks older than six months.

The best method is to commence from the last inter-costal cavity. The death rate amounts to about 1—5 %. The chief cause of death is hemorrhage.

After castration the following will be noticed; dull feathers, pale comb and wattles, hoarse voice, bigger bones, increase in weight, especially from the fourth month after the operation; hypertrophy of the hypophyse, atrophy of the small brains.

The History of the Castrating of Cocks. Zur geschichtlichen Entwicklung der Kastration der Hähne by Dr. S. Dreifus, Friesenheim i. Baden. Tierärztliche Rundschau, 21 Oct. 1928, p. 787.

Castration has been mentioned in the Talmud and many other very old manuscripts. A review is given of the various methods of operation in olden times. The Chaldeans, Babylonians, Greeks and Romans only knew of the pseudo-castration. During the Middle Ages, the operation was also practised in Middle Europe, both on poultry intended for food and as a curative. During recent years caponising has been practised more extensively in France and America.

The development of the Processus uncinatus of the ribs. Le développement de l'apophyse oncinée chez le Poulet et sa Signification by Suzanne Anasiewiczówna. Comptes rendus de la Société de Biologie, 5 Oct. 1928, p. 1049.

Studied the development of the processus uncinatus on poultry embryos. This processus must be considered as a rudiment of ribs which are found in other classes of animals.

Fresh eggs and cooled eggs. Oeuf frais et oeuf réfrigéré by C. Bidault. Recueil de médecine vétérinaire, 1928, p. 617.

There are two ways of cooling eggs. In the one method the eggs must be placed point downwards in a temperature of about 0° C.; in the other, according to Lescarde, the air is replaced by a mixture of 95 % carbonic-acid and 5 % nitrogen. A description is given of various methods which have been tried for the purpose of distinguishing the age of eggs.

The writer made a special study of the method of crystallising the ovalbumen. After the 20th day the ovalbumen did not crystalize further. In the case of cooled eggs no crystallisation took place after the 11th month,

Artificial Lights for late hatched Leghorn Pullets by R. T. Parkhurst, Director, National Institute of Poultry Husbandry. The Harper Adams Utility Poultry Journal. Nov. '28.

Conclusions:

1. Under the conditions of the experiment, late hatched (May) pullets proved profitable. Due to the relatively small size of eggs they produced, however, their value is considerably below earlier hatched pullets for winter production of standard eggs.
2. The pullets given lights responded to artificial illumination especially in the winter period, and gave better production and profit over feed and lighting costs than the unlighted pullets.
3. The experiment proved that satisfactory inexpensive devices may be arranged for automatic regulation of the lights.
4. A reasonable allowance of artificial illumination did not injure the health of the birds. There was no ill health or excessive mortality.
5. The body weight increased very materially during the experiment, but especially during the lighting period.
6. Food consumption is materially increased by the use of lights.
7. Estimating the cost of electricity at 7d. per unit the cost of lighting was 2d. per bird. The margin of income over the combined feed and lighting costs was 14s. 6.4d. per bird in the lighted pen, 1s. 8.4d. per bird more for the 48 week period than the margin of income over feed cost in the unlighted pen.

Hybrid Vigor in Poultry by D. C. Warren, Kansas State, Agricultural College. Poultry Science, 1927, p. 1.

Summary:

1. The F₁ hybrids resulting from crossing the Single Comb White Leghorn and the Jersey Black Giant hatched better, grew faster and produced better than did the two breeds crossed. They also showed a lower mortality.
2. In all comparisons, excepting one, the differences were statistically significant.
3. The adult size of the hybrids was intermediate between that of the two breeds crossed.

Genetic Studies in Poultry. II The Inheritance of Skin Color by W. V. Lambert and C. W. Knox, Department of Poultry Husbandry, Iowa State College, Ames, Iowa. Poultry Science 1927, p. 24.

Conclusions:

1. White skin, beak and shank color is dominant over yellow color.
2. The inheritance of these two colors may be explained by the action of one pair of factors. (W) for white and (w) for yellow.
3. These factors (W and w) are inherited independently of the factors causing colored and white plumage (C and c).

Further Experiments in feeding Thyroid to Fowls by L. J. Cole and F. B. Hutt, Agric. Exp. Station, University of Wisconsin, Poultry Science, 1928, p. 60.

Summary:

1. Hen-feathering was induced in male fowls by feeding both desiccated and raw thyroid.
2. In males of a dimorphically-colored breed the color pattern of the feathers was changed from that of the male to that of the female by thyroid feeding.
3. At our dosage there was no appreciable evidence of the lack of pigmentation in new feathers described by other investigators.
4. Raw thyroid appeared to have less stimulating effect on feather growth than desiccated thyroid at approximately the same level of feeding (based on assumed iodine content).
5. Feather structure in Sebright males was unaffected by thyroid feeding.
6. A daily dose of 59 mg. desiccated thyroid per pound of live weight hastened the normal moult of yearling hens.
7. The same dosage did not have any appreciable effect on body weight or egg production during the period of four months.

Relation of Age of Parents to Hatchability, Livability, and Fecundity in the domestic Fowls by F. A. Hays, Massachusetts Agric. Exp. Station. Poultry Science, 1928, p. 106.

Summary:

Although a statistically significant difference in the mean hatchability of the mates of cockerels and the mates of the same males as yearlings does not occur, the majority of the females mated to the two groups of males studied show a slightly greater hatchability from the yearling mates. Such evidence although inadequate, does indicate that mature males are more likely to give higher hatchability than are cockerels.

In a similar manner, the data suggest, though to a less pronounced extent, that yearling hens tend to give a slightly higher hatchability record than do the same individuals as pullets. These data do not agree with more extensive data reported in earlier years for the same flock (Hays and Sanborn 1924 loc. cit.) In the earlier flocks the mean hatchability of 253 birds was $57 \pm .011$ per cent as pullets and $48 \pm .013$ per cent as yearlings.

In four out of the five identical matings reported, the hatching record from the yearling parents excels that of the young parents. Here is afforded a small amount of evidence as to a possible cumulative effect on hatchability with age when identical matings are used. The mean hatching record the second year is also substantially higher than that of the first year.

Mortality records in daughters as affected by age of sires are greatly complicated by disease in 1924 so that no deductions seem justifiable.

Mortality records in daughters as related to age of mothers are also altered by disease so that no conclusions may be drawn.

Mean mortality rates in case of the identical matings on two successive years differ so widely that there is some evidence of greater livability in daughters from yearling males and females than from young males and females. The data are far too meager to carry any great weight, however.

No evidence of any relation whatever between age of parents and fecundity is shown by any of the data.

The Death Rates of three Standard Breeds of Fowl by J. A. Harris and D. C. Boughton Department of Botany and Dep. of Zoology, University of Minnesota. Poultry Science, 1928, p. 120.

Summary and Discussion:

The present study has dealt with the problem of differences in the death rates of three standard breeds of fowl, the Rhode Island Red, the White Wyandotte, and the White Leghorn.

It has been shown that during the first laying year the death rate of the White Wyandotte breed is significantly higher than that of the Rhode Island Red or the White Leghorn breed. These results are found whether the death rates are based on the number of birds alive at the beginning of the year or upon the number of birds alive at the beginning of each individual

month. They hold, with slight exceptions, for the individual months of the year, for the annual death rates of the eleven individual years, or for the annual death rate for the whole period of eleven years. In cases in which it is practicable to determine probable errors the differences in the death rates of the two breeds compared are from about 6.4 to about 9.7 times as large as their probable errors.

The Rhode Island Red breed shows a somewhat higher death rate than the White Leghorn breed. Since White Wyandotte birds show a higher death rate than either Rhode Island Red or White Leghorn birds, the differences between the two latter must be smaller than those between White Wyandotte and Rhode Island Red or between White Wyandotte and White Leghorn. For the year as a whole the death rate of Rhode Island Red birds is higher than that of White Leghorn birds by an amount which is 3.7 times as large as large as its probable error. These results leave no doubt as to the existence of differences in the death rates of the different breeds of the domestic fowl when maintained under identical conditions.

A certain parallelism is shown between the monthly death rates and the average monthly egg productions of each breed. Both increase from the beginning of the laying year to a maximum and decrease toward the end of the laying year. It is suggested that there may be some relationship between the strain placed upon the organism by heavy egg production and the incidence of death. It is clear, however, that this presents a group of problems requiring more extensive investigation.

Finally, emphasis should be laid upon the desirability of more detailed and extensive study being made of not merely the incidence but the causes of mortality in large groups of birds maintained under as nearly as possible controlled conditions. The birds which die during the year represent a very material fraction of the total number which entered on their first year of laying activity. The percentage is sufficiently high to be the cause of serious financial loss. Furthermore, our earlier studies have shown a lowered egg production in birds which die at a period subsequent to that during which egg production is measured. This represents an additional source of financial loss.

Mortality in the domestic fowl presents a whole group of problems of great theoretical interest and practical importance which can be solved only by the application of biometric methods to larger and more refined series of observational data which should include autopsy determinations of the cause of death in the case of each individual bird.

The Welsummer Fowl by D. J. Holsteyn. Poultry 21th Dec. 1928.

A warning to be cautious when buying Welsummers. Who wants reliable advice can apply for information to Ir. G. J. Tukker, Director of the State Breeding Station at Beekbergen (Holland) who is also Secretary of the Dutch Club for promotion of the Welsummer breed.

DISEASES

BACILLARY WHITE DIARRHEA

B. pullorum isolated from sparrows by T. Dalling, J. H. Mason and W. S. Gordon, Langley Court, Beckenham, Kent. The Veterinary Record. April 28th. 1928/

Authors have, without success, searched the literature on B. W. D. for any record of B. pullorum in any animal except the domestic fowl. Authors isolated B. pullorum from the liver of a sparrow which was caught in a chicken run in which chickens had succumbed to B. W. D. The sparrow showed evidence of diarrhea. Also from other sparrows, having been caught in chicken runs have been isolated. These findings open up the question of a further source of infection of chicks with B. W. D.

Bacillary White Diarrhoea. Results of testing a breeding Flock by T. Dalling, J. H. Mason, and W. S. Gordon, Langley Court, Beckenham, Kent. The Veterinary Record. Aug. 13th. 1927/

Summary and Conclusions:

(1) A flock of hens, of which about 11 % reacted to agglutination and intradermic tests, produced eggs from which about 40 % of the chicks hatched died of B. W. D.

(2) From about 20 % of the unhatched eggs cultures of B. pullorum were grown.

(3) Hens which were non-reactors to the agglutination and intradermic tests produced healthy chicks.

(4) Hens reacting to both tests produced chicks of which 20 % died of B. W. D.

Bacillary White Diarrhoea of Chicks by T. Dalling, J. H. Mason and W. S. Gordon, Langley Court, Beckenham, Kent. The Veterinary Journal. Vol. 83, p. 555—565/

Summary:

(1) Fowls up to one year old have been infected by feeding large volumes of B. pullorum broth culture. Deaths may occur soon after infection or hens may live for months when B. pullorum may be isolated from the ovary.

(2) Non-reacting cockerels may be made to react to the agglutination test by intravenous or intratesticular injections of B. pullorum. Such cockerels do not appear to transmit infection to hens mated with them.

(3) Natural and artificially infected hens do not appear to transmit infection to normal hens in the same pens or to chicks bred from clean stock when placed in contact.

(4) A clean cockerel mated with infected and clean hens does not appear to cause infection of the clean stock.

(5) A considerable variation in the agglutination titre of fowls' serum

may occur from time to time, and there is evidence that a strongly positive hen whose ovary contains *B. pullorum* may at times show a negative agglutination reaction.

(6) Various methods of making antigens for use in agglutination tests have been the subject of experiment.

(7) *B. pullorum* was recovered from about four per cent, of the eggs laid by natural and artificial "carrier" hens.

(8) Attempts to cause *B. pullorum* to pass through the shells of eggs were unsuccessful.

(9) Gas-producing strains of *B. pullorum* may lose this quality in the laboratory.

(10) In our hands, as far as agglutination is concerned, *B. pullorum* and *B. gallinarum* are identical.

(11) Hyperimmune serum may be useful in hatches of chicks in which a light infection of *B. W. D.* is present.

The accuracy of the agglutination test in the diagnosis of Bacillary White Diarrhea by P. R. Edwards and F. E. Hull. Agric. Exp. Station, Lexington, Kentucky. Journ. of the American Vet. Med. Association 1928 p. 839.

The purpose of this paper is to give the results of tests conducted in a manner similar to those of Beach and Merrick. The sera were divided into eight equal parts and sent to different investigators. The results of these tests, which are given in table I, are very uniform.

It is the writers' opinion that these results demonstrate that the agglutination test for the detection of bacillary white diarrhea is an accurate method of diagnosis. It is extremely unfortunate that the work of Beach and Merrick, has been given wide publicity by certain commercial hatcheries and other persons who are seemingly interested in discrediting the agglutination test.

A Medium for the Isolation of Salmonella Pullorum and other Members of the paratyphoid Group from Avian Tissues by W. L. Mallmann, F. Thorp and M. Semmes. Michigan State College. East Lansing, Mich. Journal of the American Veterinary Medical Association 1928, p. 825.

Brilliant green, when added to nutrient agar, allowed unrestricted growth of *S. pullorum*, *S. gallinarum* and all other members of the paratyphoid group. Brilliant green has a selective inhibitory effect upon *E. coli*, and inhibited the growth of Gram-positive organisms found as contaminants in the usual autopsy plates. The bacteriastatic effect of brilliant green obtained from various manufacturers gave decided variations.

Comparison of Tube and Slide agglutination tests for Bacillary White Diarrhea by L. D. Bushnell and C. A. Brandly. Kansas Agr. Exp. St. Manhattan, Kansas, Journ. of the Am. Vet. Med. Ass. 1928, p. 844.

Summary: The rapid slide-test, using concentrated antigen and a short incubation period, may replace the tube agglutination test for detecting carriers of bacillary white diarrhea. A freshly prepared antigen has given much better results than one which has been kept for several days even in the ice-box. The dilution should be retained at 1 to 25, as has been recommended for the tube-test.

Bacillary White Diarrhea. Beobachtungen über die bakterielle Kückenruhr in Schlesien by Dr. Lerche, Breslau. Deutsche Tierärztliche Wochenschrift. No. 42, 1928, p. 709.

Conclusions:

1. Bacterial chicken diarrhea occurs also in ducks.
2. Bact. pullorum and bacterial gallinarum cannot be distinguished either culturally, bio-chemically or sero-logically.
3. The separation of typhoid and B.W.D. is clinically and pathologically anatomically impossible. Both diseases are identical.
4. No certainty can be obtained, as to which birds are infected, from an examination of the blood of full grown hens. Negative reactionary birds may also be infected and lay infected eggs.
5. The titers, which up to the present have been looked upon in the agglutination-test as positive titers, are untenable.
6. The killing of positive reactionary birds cannot, in general, be recommended for the combatting of B.W.D.
7. The State must help in the further investigation by placing a few infected flocks under control, and by stationing a veterinary surgeon at the farms.

Bacillary White Diarrhea in Switzerland. Ueber das Auftreten der weissen Ruhr der Kücken by Dr. L. Riedmüller and Dr. N. Weidlich. Veterinär-pathologisches Institut der Universität Zürich. Schweizer Archiv für Tierheilkunde. Zürich 1928, p. 544.

Until 1928 B.W.D. was not known in Switzerland but the writer has now discovered it there. Both chickens and ducklings died. The death rate amounted to 84.5 %. A second case occurred in Switzerland, among chickens which had been imported from France.

Comparative Experiments with Bac. paradysenteriae. Vergleichende Untersuchungen über das Bact. paradysenteriae. (Bac. gallinarum Klein, Bact. sanguinarium Moore, Bac. typhi gallinarum alcalifaciens Pfeiler.) by Dr. Gressel. Hygienisches Institut der Tierärztliche Hochschule, Hannover. Deutsche Tierärztliche Wochenschrift 1927, p. 267.

The „Klein” bacil must be separated from the paratyphoid group and the name proposed by Miessner, Bact. paradysenteriae gallinarum (Klein) is therefore better.

Paratyphoid and Paradysenteria. Paratyphus und Paradysenterie by Prof. Dr. H. Miessner, Hanover. Deutsche Tierärztliche Wochenschrift 1927, p. 149.

The definition „Poultry Typhoid” is incorrect, as the relationship with the typhoid bacil is not so great as one might conclude from the name. The relationship with the Bact. dysenteria is bio-chemically and biologically much nearer, so that it is proposed to name the cause of Paradysenteria gallinarum „Bact. paradysenteria” (Klein).

Effect of Bacillary White Diarrhea Infection on Egg Production
by V. S. Asmundson and Jacob Biely. University of British
Columbia, Vancouver. Poultry Science, Vol. VII., No. 6, 1928.

It was found that the average first year (Nov. 1 to Oct. 31) egg production of 58 hens that reacted positively was 53 eggs lower than that of 300 hens that reacted negatively to the agglutination test for Bacillary White Diarrhea. The 358 hens represented six different breeds.

The proportion of the reacting and the non-reacting hens in different fecundity classes was: 149 eggs or less — 36.2 % of the reactors, 7 % of the non-reactors; 225 eggs or over — 15.5 % of the reactors, 54.0 % of the non-reactors.

The range in the first year egg was 9 to 283 eggs in the case of the non-reactors. Because of the variability in the first year egg production of reacting hens it is concluded that reactors cannot be eliminated from an infected flock by culling out the low producers.

Bacillary White Diarrhea of Chicks by T. Dalling, J. H. Mason
and W. S. Gordon, Langley Court Beckenham, Kent. The
Veterinary Journal. Vol. 83, p. 555—565.

Summary:

(1) Fowls up to one year old have been infected by feeding large volumes of *B. pullorum* broth culture. Deaths may occur soon after infection or hens may live for months when *B. pullorum* may be isolated from the ovary.

(2) Non-reacting cockerels may be made to react to the agglutination test by intravenous or intratesticular injections of *B. pullorum*. Such cockerels do not appear to transmit infection to hens mated with them.

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(5) A considerable variation in the agglutination titre of fowls' serum may occur from time to time, and there is evidence that a strongly positive hen whose ovary contains *B. pullorum* may at times show a negative agglutination reaction.

(6) Various methods of making antigens for use in agglutination tests have been the subject of experiment.

(7) *B. pullorum* was recovered from about four per cent. of the eggs laid by natural and artificial „carrier” hens.

(8) Attempts to cause *B. pullorum* to pass through the shells of eggs were unsuccessful.

(9) Gas-producing strains of *B. pullorum* may lose this quality in the laboratory.

(10) In our hands, as far as agglutination is concerned, *B. pullorum* and *B. gallinarum* are identical.

(11) Hyperimmune serum may be useful in hatches of chicks in which a light infection of B.W.D. is present.

A Study of various Methods of preventing Rickets in Chicks by G.
T. Klein, Kansas State, Agricultural College. Poultry Science
1927, p. 31.

Conclusions:

1. Irradiated cottonseed oil, as carried out in these experiments, in amounts

- of two percent of the ration had little, if any, effect in preventing rickets in growing chicks.
2. Direct sunshine through an open window (three by four and one-half feet) provided sufficient ultra-violet rays to prevent rickets in a lot of 45 growing chicks.
 3. Protection against rickets was obtained on long exposure to the light produced by the murcery arc glass tube lamp (Coop-er-Hewitt Work Lamp). This light contains no wave lengths shorter than 300 mu.

Can Bacillary White Diarrhea be transmitted by Droplet Infection?
by R. P. Tittsler, Pennsylvania State College. Poultry Science,
1928, p. 79.

Discussion:

The data reviewed in this paper suggests a source of bacillary white diarrhea dissemination not reported previously. It is logical to believe that the disease germs are expelled in the moisture of the breath and that healthy chicks will contract the disease from inhaling the infected air. This hypothesis is presented after making a very careful study of the pathology of the lungs from diseased chicks as reported by others and also as observed repeatedly by the writer while making routine examinations during the past several years.

Certain facts, which contributed to this hypothesis, appear to be well established. Many investigators have reported the common occurrence of congestion and nodules in the lungs of diseased chicks. Several workers have isolated *Sal. pullorum* from the lungs. Hinshaw and his associates showed that the disease germs can be spread through the air of the incubator. They were able to produce disease by introduction of *Sal. pullorum* into the nostrils of healthy chicks. If infected chicks expel the disease germs from their lungs it may be possible for even a single egg-yolk-infected chick to infect an entire batch either before the chicks are taken from the incubator or after they are placed in the brooder. Perhaps this source of dissemination is more important than infected down, droppings, water or feed because of the almost immediate transfer of bacteria from chick to chick and also because such infection would take place in the incubator during the most susceptible age, which is the first 24 hours.

If the disease is spread in this manner infection may occur in spite of ordinary control measures. While the incubators can be cleaned and disinfected when empty there is no available means of sterilizing the air in it while chicks are hatching. The frequent cleaning and disinfection of the brooder, the protection of feed and the use of chemicals in the drinking water have proved beneficial but will not prevent infection from being transmitted through the air.

While no positive statements can be made, at this time, to the effect that the germs of bacillary white diarrhea are expelled from the lungs of diseased chicks and that they may enter either the nostrils or mouth directly from the air, it is desired to call the attention of poultry investigators, hatcherymen and chickraisers to such a possibility. It is hoped that this will stimulate a desire to use eggs from tested hens only and furthermore that it will emphasize the danger associated with custom hatching unless all eggs are from disease-free flocks.

TUBERCULOSIS

Experiments on Avian Tuberculosis of Hogs and Hens. Testing of anti-septica. Weitere Untersuchungen über die Geflügeltuberculose. Infektionsversuche an Schweinen und Hühnern. Prüfung von Desinfektionsmitteln by Prof. Dr. Raebiger, Halle. Deutsche Tierärztliche Wochenschrift 1928, No. 42, p. 701.

Experiments have proved that when pigs are naturally infected with Avian Tubercle Bacilli very little danger may be feared. Still, pigs should be safe-guarded against infection by poultry tubercle bacilli.

At various times eggs have been found to contain tubercle bacilli. Tubercle bacilli were found in the blood of hens to which tubercle bacilli had been administered, two days after administration. Eleven days later tubercle bacilli were found both in the white and the yolk of the eggs. Living tubercle bacilli were found in eggs which had been boiled for 5 minutes. Mention of 21 cases of spontaneous avian tuberculosis in human beings since 1893, can be found in literature. Carbolic acid appeared to be one of the best methods of disinfection against tubercle bacilli.

Avian tubercle-bacilli in hogs. Weitere Untersuchungsergebnisse über das Vorkommen von Geflügeltuberkelbazillen beim Schwein by Dr. W. Lentz, Berlin. Deutsche Tierärztliche Wochenschrift 1928, No. 42, p. 707.

After vaccination on guinea pigs, 13 cases of general hog tuberculosis, 7 cases of cattle tuberculosis, 1 case of mixed infection, (cattle and avian tuberculosis), and 3 cases of avian tuberculosis were discovered.

Out of 46 cases of local tuberculosis, 18 cases of cattle tuberculosis and 20 cases of avian tuberculosis were discovered.

Conclusions:

1. It was not possible to distinguish the tuberculose processes by microscopical examination.
2. Valuable results were obtained both by cultivation and by vaccination of guinea pigs.
3. Avian tubercle bacilli were found both in local and in general hog tuberculosis.

Avian Tuberculosis. Die Geflügeltuberkulose by Dr. F. Schmidt. Arbeiten der Landwirtschaftskammer für die Provinz Sachsen. Hft. 49. Halle a. Saale 1928.

During the years 1925, 1926 and 1927 statistics were compiled regarding tuberculosis. Ways and means of combatting the disease are discussed and the necessity of combatting the disease is also pointed out, with a view to the health of human beings and pigs.

Avian tuberculosis in Cattle. Vorkommen sowohl Geflügel- als auch boviner Tuberkelbazillen bei derselben Kuh by N. Plum. „Actiologie, Prophylaxe und experimentelle Therapie der

Infektionskrankheiten. Organ für praktische Aerzte und Tierärzte, 1928, p. 72.

In a cow, which had repeatedly aborted, avian tubercle bacilli were found to be the cause of abortus. When the cow was slaughtered tuberculous processes were found in the lung. From these sources a breed was cultivated which possessed the qualities of both cattle and avian tubercle bacilli.

DIPHTHERIA AND POX

Avian Diphtheria in Rabbits by Kasai, Hisao and Kondo at Soichi. Journal of the Japanese Society of Veterinary Science. Tokyo, 1927, p. 323.

Material from pigeons infected with bird pox was inter-testically injected into rabbits. After a few passages the virus adapts itself to the rabbits' body and is absolutely similar to cow-pox virus. The writers consider that bird pox and human pox are etiologically similar diseases.

Vaccination against Diphtheria. Die Impfraspel, ein neues Instrument zur Geflügelpockenschutzimpfung by Dr. K. Rasch. Serum-Institut der Tierärztlichen Hochschule, Berlin. Berliner Tierärztliche Wochenschrift, 1928, p. 711.

The Serum Institute in Berlin have succeeded in preparing a useable vaccine against diphtheria. This vaccine is injected in the follicles of the legs by means of an instrument (trephine) with blunt teeth. This opens the follicles but the wound is not deep enough to cause bleeding.

Vaccination against Diphtheria. Beitrag zur aktiven Immunisierung gegen Pocken und Diphtherie der Hühner by Dr. R. Baumann. Bundesanstalt für Tierseuchenbekämpfung in Mödling bei Wien. Archiv für Wissenschaftliche und Praktische Tierheilkunde. Bd. 57, Hft. 4, S. 299.

After an extensive literary review the writers own experiments are described.

Success was obtained with Dutch vaccine, in large flocks in which the disease was in the first stadium.

Through tests on various classes of animals the writer came to the conclusion that anti-diphtheria is pigeon-virus. Tests have been made with pigeon virus and good results obtained. The method of preparing the vaccine is also described.

Vaccination against Diphtheria. Impfungen gegen Pocken und Diphtherie der Hühner. Einwirkung von schwefliger Säure auf das Pockenvirus by Dr. R. Baumann. Wiener Tierärztliche Monatschrift, 1928, p. 832.

Zwick, Seifried and Schaaf state that pigeon virus is remarkably effective as a vaccine against diphtheria in hens. Immunity takes place after 14 days. The vaccine can be stored for a year in the form of dry powder.

Disinfection with sulfoliquid in a 5 % solution had very little effect.

Vaccination against Diphtheria. Ueber Immunisierungsversuche gegen die Pocken und Diphtherie der Hühner by Dr. Karsten and Dr. Lüttschwager, Hannover. Deutsche Tierärztliche Wochenschrift 1928, No. 42, p. 713.

The writers have tried various methods, which however, were not satisfactory, among others, rubbing the plucked skin with hen virus, and Beach's method. The pigeons were rubbed with virus on the plucked breast-skin. After two weeks pox occurs, which, crushed fine and mixed with glycerine, are rubbed into the bare skin of hens.

Immunisation against Diphtheria. Immunisierungsversuche gegen Pocken und Diphtherie der Hühner by Dr. Raebiger, Halle-Saale. Deutsche Tierärztliche Wochenschrift, No. 42, 1928, p. 711.

In November 1925 the Serum Department of the Hygiene Institute of the Berlin University commenced experiments for the preparation of an anti-diphtheria vaccine. In September 1927 the vaccine was prepared, and experiments during 1928 have proved that good results can be obtained therefrom. The vaccine is now being prepared in the institute of Prof. Dr. Dahmen at Kl. Ziethen.

Vaccination against Diphtheria by J. Basset. Revue vétérinaire, 1928, p. 189.

The vaccine, which consists of living infectious matter, is injected into the breastmuscle of animals, which are at least 4—5 months old. For the younger animals two injections must be administered. The immunity begins 3 weeks after vaccination and lasts about one year.

Fowl Pox by T. M. Doyle. The Journal of the Ministry of Agriculture. Dec. 1928, p. 838.

Summary: 1e. Every case of disease determined by the virus of fowl pox no matter what be the symptoms manifested or the lesions induced, should be termed fowl pox.

Both comb and mouth lesions in birds affected with fowl pox are due to the same virus. The comb form confers immunity against the mouth form, and vice versa.

2e. The use of the term „roup” should be restricted to the condition characterized by catarrhal inflammation of the eyes and nose when these are unaccompanied by lesions of fowl pox in any bird of the flock.

3e. Birds showing lesions of fowl pox should be immediately destroyed. In-contact birds should be isolated and frequently examined. This is the quickest and most economical method of eradicating the disease.

4e. All newly purchased birds, and those returned from shows and laying trials, should be isolated for one month before being allowed to join the healthy stock.

275 *Poultry Raisers report on Vaccination. Survey covers 70.804 Chickens and Turkeys.* Poultry Tribune, October 1928.

Conclusions:

1. As a preventive of cold, roup and chicken pox in hatchery flocks, vaccination has proven valuable and will reduce outbreaks entirely or to a very few mild cases. Those who ship birds to poultry shows and contests, find it especially valuable because it reduces the risk to a minimum.
2. As a treatment when disease first appears, vaccination is valuable as a cure and to prevent the spread to healthy members of the flock.
3. As a treatment where a large proportion of the flock is infected, it will reduce losses considerably, especially if the flocks are not infected with internal parasites.

PARASITES

* *Nutritive observations of chicken-coccidiosis* by Nohmi, Sueichi.
Journal of the Japanese Society of Veterinary Science, Tokyo, 1927, p. 360.

Chickens with coccidiosis often get rhachitis. The rhachitis can be cured by „radiation of Quartz-light-rays“.

* *On the Trematode parasites (Genus Philophthalmus) found in the eyes of formosan domestic birds* by Sugimoto, Masaatsu.
Journal of the Japanese Society of Veterinary Science, Tokyo, 1928.

In the membrana nictitans of ducks and hens two kinds of Nematodes were found. Those of the hens were identic with *Philophthalmus galli* (Mathis & Léger 1910). Those of the ducks have also this similarity but they have at the same time a likeness to *Ph. palpebrarum*, but probably belong to a new kind of *Phil. Anatinus*. The writer gives a detailed description of this new kind.

* *Combatting gapes. Entstehung und Bekämpfung der Rotwurm-seuche des Geflügels* by Dr. Lerche. Bakteriologisches Institut Landwirtschaftskammer Niederschlesien, Breslau. Deutsche Tierärztliche Wochenschrift 1928, p. 803.

Description of the disease and its cause. The writer has studied various curative measures and describes them. The best method appeared to be an injection of an iodine preparation in the wind-pipe.

GENERAL

Difference between Bact. pseudo-tuberculosis and Bact. avicidum. Ein Beitrag zur Kulturellen Unterscheidung des Pfeifferschen Pseudotuberculosebazillus von ähnlichen Vogelpathogenen Bakterienarten. (Bact. avicidum und Bact. gallinarum.) by H. Haupt. Veterinär-Hygienisches Institut der Universität, Leip-

zig. Centralblatt für Bakteriologie, I. Abt. Originale. Bd. 109. S. 1. 1928.

Results:

1. Bact. pseudotuberculosis rodentium produces acid in adonit. Bact. gallinarum and Bact. avicidum do not. Most of the strains of Bact. pseudotuberculosis produce acid in salizin which Bact. gallinarum does not.
2. There is no difference in fermenting different sugars between strains of Bact. pseudo tuberculose of mammals and strains of turkeys and canary-birds.

Natural and artificial immunity against tetanus. De l'immunité naturelle et acquise vis-a-vis de l'Intoxication tétanique chez la Pouly by G. Ramon. Comptes rendus de la Société de Biologie 1928, p. 1473, and by M. Doyoses, p. 1722.

The hen possesses a natural immunity against tetanus, but it is possible to kill a hen with a large dose of tetanus-toxine. The vaccine circulates in the blood and disappears after 14 days. Later anti-toxine was found in the blood. In two eggs from the same hen one contained toxine and the other anti-toxine. The immunity can be considerably increased by repeated injections with toxine.

Tetanic toxin in the eggs. Sur le passage de la toxine et de l'anti-toxine tétaniques de la Poule à l'oeuf et au poussin by G. Ramon. Comptes rendus de la Société de Biologie, 1928, p. 1476.

If an injection of tetanus toxine is administered to a hen, after 2 days, this will be found in the yolk of the eggs, but not in the white. After the 15th day the toxine has disappeared from the yolk and anti-toxine will be found therein.

Chickens hatched from eggs containing anti-toxine have anti-toxine in their blood. The anti-toxine in the hen is easily transmitted to the yolk and from the yolk to the blood of the chickens.

Poultry Diseases. Die Krankheiten des Geflügels mit besonderer Berücksichtigung der Anatomie und der Hygiene by W. Otte, Doblen, Lettland. With 163 illustrations 1928. Price Mark 24. Published by Richard Schoetz, Wilhelmstr. 10, Berlin SW. 48.

This book written, by an experienced practitioner who is wellknown in the East, is remarkable for its clear and rich illustrations of the anatomy of birds. He has also gone thoroughly into the hygiene. Further, the parasitological part has been more extensively treated than is usual, especially with regard to the important role, which the parasitical Metazoen play in the spreading of infectious diseases. It makes the work of avian parasites more clear, both to students and practitioners, and forms at the same time a basis for further investigation in this field. The instructive illustrations which have been added are of considerable value. Reference is also clearly made to extracts from the newest works in this field, both home and foreign.

The book is extremely useful to practitioners and will soon, in view of the increasing interest which veterinary surgeons are taking in this subject, be as highly appreciated as the Russian work, which appeared some time ago, and was awarded a prize by the Department of Agriculture in St. Petersburg.

NUTRITION

Investigations on Fish Meals. I. The Nature of the Water-soluble Nitrogen Compounds by W. L. Davies. Agricultural Department, University College, Reading-Journal of the Society of Chemical Industry. Oct. 16. 1925. Jan. 29, '26.

The amount and nature of the water-soluble nitrogenous compounds of various fish meals vary considerably owing to the differences in treatment during manufacture. 'Yellow' fish meal extracts contain a larger amount of simple protein degradation products than do the extracts of 'white' meals.

From one- to two-fifths of the total nitrogen of fish meals is water-soluble and a determination of the diamino acid content in hydrolysed aqueous extracts of meals showed that on the average the compositions of these extracts compared favourably with those of some protein hydrolysates. Variation in the amount of volatile bases in the aqueous extracts was encountered but the ammonia content was fairly constant.

A study of the organic acids, volatile and non-volatile indicated that more decomposition of fat and amino acids had occurred in the 'yellow' meals than in the 'white' products.

Investigations on Fish Meals. II. Changes occurring in the water-soluble nitrogen and in the amount of water-soluble phosphorus with different methods of treatment and storage.

Samples of five types of fish meals, three of the white variety and two of the yellow, were stored (a) in a cold wet state for 3 weeks, (b) in a warm wet state for 3 weeks, (c) in open vessels for 7 months, (d) in paper bags and (e) in a warm dry incubator at 38° for 7 months.

Aqueous extracts of these treated meals (extracted in the ratio 1 of meal to 7 of water) were examined for initial acidity, water-soluble nitrogen compounds, titratable acid radicals and amino groups in alcoholic solutions obtained from these extracts, volatile bases in the alcoholic extracts, and soluble phosphates in the aqueous extracts.

Acidity in the extracts were found to be greatest with these of meals subjected to the short wet treatments and those in which moulds had grown. Increase of water-soluble nitrogen varied with type of meal and method of storage. Short wet treatments caused more nitrogen to go into solution except with a resistant yellow meal and a white shelly meal. There was a tendency with long periods of storage for the amount of water-soluble nitrogen to diminish except in the case of a very good white meal which showed constant values irrespective of treatment. In all cases the amount of nitrogen appearing in the 'alcoholic extract' was a higher percentage of the water-soluble nitrogen than in the original meals. Tables were given showing the increase in soluble nitrogen both in water and in alcohol for each meal. The states of the nitrogen compounds in the aqueous extracts were determined by carrying out the titration of the acid radicles and the free amino groups in solution by making the solutions over 70 % alcohol and using thymolphthalein and methyl red as indicators respectively, and on the results obtained, conclusions drawn concerning the process of breaking down which had occurred during keeping.

The increase in volatile base content with wet treatment was establish-

ed while with the other treatments, loss of volatile base to the extent of from 1 to 3.6 % of the total nitrogen was shown. The loss was due to escape into the atmosphere and was greatest with the warm dry treatment.

Initial acidity had no effect on the phosphorus entering into solution but warm dry treatment had the greatest effect in increasing the amount of soluble phosphorus. Mould growth caused a decrease of soluble phosphorus.

Wet treatments caused meals to grow unwholesome but the dry treatments gave no fetid odour even in cases of slight mould growth. Bag storage caused oily meals to grow rancid and some white meals to grow unwholesome and fetid of odour.

Commercial Feeding Stuffs, Circular No. 147. August 1927. Purdue University Agricultural Experiment Station, Lafayette, Indiana.

This circular contains a condensed report of Indiana's 1926 commercial feed inspection.

It is estimated that 337,298 tons of commercial feeds with a retail value of \$16,837,512 were sold in Indiana in 1926. The inspectors of the State Chemist department secured 2,669 samples or approximately one sample for each 126 tons of commercial feeds sold in this State.

Of the 2,669 samples collected, 1,960 were analyzed chemically and 709 were examined microscopically. It was found that 85 per cent of the samples were equal to or better than the manufacturer's guarantee as declared on the official label and 404 were not in accord with the official label. Of the 404 samples incorrectly guaranteed, 230 of them would be classed as seriously deficient and sold in violation of the law. Shipments seriously deficient were withdrawn from sale and manufacturers relabeled such feeds correctly and made refunds amounting to \$1,081 to the agents and consumers.

The composition of mineral feeds and the rules governing their registration in Indiana.

The Definitions of Feeding Stuffs adopted by the Association of Feed Control Officials.

The average analyses of the common cereals and by-product feeds.

Table III gives the standing of each feed manufacturer on the basis of compliance with the Indiana Feeding Stuffs law. Feed agents particularly should study Table III and handle feeds from manufacturers having a good standing. It is a monetary loss to any feed dealer if the feed manufacturer delivers a car of feed not labeled correctly. The dealer is forced to withhold this feed from sale until the manufacturer can rectify his negligence.

The Effect of cystine on the endogenous metabolism of molting hens by C. W. Ackerson and M. J. Blish, Department of Agric. Chemistry, University of Nebraska, Lincoln Poultry Science, Vol V, no. 4.

The average endogenous loss of nitrogen of six molting hens was 239 m.grs. per K.G. per day. With 150 m.grs. of cystine daily added to the nitrogen free ration, the average endogenous loss of nitrogen of six other molting hens was but 137 m.grs. per K.G. daily.

The cystine fed exerted a protein sparing effect out of proportion to its nitrogen content.

Definitions of Feeding Stuffs, adopted by the Association of Feed Control Officials of the United States, by L. E. Bopst. Secr.

Treasurer Ass. of Feed Control Officials of the U. S. College Park. Maryland. Included November Meeting, 1927.

Contains definitions of Barley products, Brewers' and Distillers pr., Buckwheat pr., corn pr., oilcake, cottonseed pr., linseed pr., oat pr., peanut pr., rice pr., rye pr., velvet bean pr., wheat pr., mineral feeds, miscellaneous pr., animal by-products.

Ascertaining the percentage of Salt in Fish Meal. Zur Methodik der Kochsalzbestimmung in Fischmehlen by O. Wille. Institut für Seefischerei, Wesermünde. Die Fischwirtschaft 1928, p. 154.

The highest figures are obtained by the phosphor wolfram-acid-method. The lowest results are obtained by the soda method. It is of importance that the ascertaining of the percentage of salt in fish-meal should be carried out as accurately as possible.

Avitaminosis in Poultry. Nutritional Roup. Eine in Deutschland bisher unbekannte, seuchenhaft auftretende Nährschadenkrankheit (Avitaminose) bei Hühnern by Dr. O. Seifried and Dr. J. Schaaf. Tierseuchen-Institut der Landesuniversität, Giessen. Archiv für wissenschaftliche und praktische Tierheilkunde, 1928, Bd. 58., p. 357. Tierärztliche Rundschau, 1928, p. 927.

Conclusions: At various poultry farms a disease was discovered which appeared to be infectious, and which was very similar to Coryza Contagiosa and Diphtheria. The cause of the disease was lack of Vitamin A in the food, and is known in America as Nutritional Roup. The disease can be avoided by green foods and cod-liver-oil.

Moulting of chickens influenced by feeding Thyroid glands. Déterminisme thyroïdien de la poussée du plumage adulte chez les poulets by Ch. Champy and J. Morita. Comptes rendus des Séances de la Société de Biologie, 1928, p. 1116.

The tests made by Zawadowski have been repeatedly controlled by other biologists. In these tests very large doses were administered to full grown hens. The writers made tests on young poultry. In young birds which have already moulted nothing special is noticeable after injections of thyroid-extract. If the dose injected is too large the birds grow thin and die. In young chickens, which are still covered with down, the growth of the feathers is promoted considerably. The general growth of the birds is also quickened but many chickens die. The feathers which grow also show sexual differences.

The Vitamin A and Vitamin D content of Cod Liver Meal by E. M. Cruickshank, E. B. Hart and J. G. Halpin, Departments of Agricultural Chemistry and Poultry Husbandry, University of Wisconsin, Madison. Poultry Science 1927, p. 9.

Summary:

The sample of cod liver meal used in this experiment contained sufficient vitamin D to promote good calcification in chickens when fed at levels of 1 per cent and 3 per cent.

Even 10 per cent of the cod liver meal was not sufficient to protect chickens against a vitamin A deficiency.

Weak Bones in crate fed Poultry by F. E. Mussehl and S. J. Marsden, University of Nebraska. Poultry Science, 1927, p. 41.

Conclusions:

1. There was no marked deterioration in the bone structure of good vigorous cockerels after 29 days of crate feeding with a simple fresh buttermilk moistened mixture without mineral or vitamin D additions. Apparently enough of the antirachitic factor was provided in the basal ration used or was stored in the body of the bird to meet the requirements for the extended feeding period during which weight was increased 64 per cent.
2. The addition of the particular mineral mixture used was, with respect to our basal ration, entirely superfluous though apparently not harmful in the quantity used.
3. The addition of irradiated corn oil to the ration used in this experiment did not enhance its feeding value.
4. The conclusion also seems justified that weak bones in crate fed poultry are usually due to poor rations and poor rearing conditions before the birds reach the feeding stations.

Yeast in Poultry Nutrition. I The Value of Yeast and Semi-solid Buttermilk in promoting the growth of chickens by J. E. Dougherty. Division of Poultry Husbandry, University of California. Poultry Science, 1928, p. 72.

Summary:

1. The addition of pure, dried, granulated yeast at the rate of 5 % to the mash fed to growing chicks stimulated the appetite and promoted a material increase in rate of growth.
2. Feeding this yeast mash moistened or fermented showed no advantage over feeding it dry. In fact smaller gains were obtained.
3. On the basis of the cost prices used, the cost of the yeast more than offset any advantage gained in increased rate of growth as compared with the control lots.
4. The addition of yeast or semi-solid buttermilk to the basal diet used was not found to be of any value in preventing disease and reducing mortality.
5. Semi-solid buttermilk paste proved, at 3½c per pound, a very profitable addition to the ration in promoting growth.
6. Price is evidently the most important factor governing the use of yeast and semi-solid buttermilk in the commercial rearing of chicks.

Growth Values of Proteins from commercial Animal Products. I Commercial Meat and Bone Scraps by R. W. Prange, C. W. Carrick and S. M. Hauge, Agric. Exp. Station, Purdue University. Poultry Science 1928, p. 95.

Summary:

1. Optimum growth with young chicks was obtained when proteins from meat and bone scraps supplied 10 to 12 per cent of the ration used.
2. Meat scraps from various manufacturers did not give the same rate of growth when fed at the same protein level with mineral variations equalized.
3. The maximum amount of meat and bone scraps fed did not appear to increase mortality.

EXTENSION

Vineland Contest Winners Average 254 Eggs In Year, New Jersey Agriculture, New Brunswick, N.J., December 1928.

Charles W. Brown, Vineland, with an entry of 10 heavy-producing White Leghorns, won the Vineland International Egg-Laying Contest, which closed its twelfth year on October 22. His birds laid 2,544 eggs, an average of 254 eggs per bird, and more than 100 eggs ahead of the runner-up.

The 1,000 birds in competition, owned by 100 different breeders, averaged approximately 174 eggs per bird for the 51-week period of the contest.

Results of the IInd Polish Egg Laying Contest by Maurice Trybulski. Warsaw, 30 Kopernikastreet, 1926.

Summary:

The IInd Egg Laying Contest was organized in 1925 in Chyliczki (near Warsaw) by the Central Committee of Poultry Breeding with the assistance of the Ministry of Agriculture and State Domains. The contest was managed by Mr. Maurice Trybulski and lasted from February 1-st until November 15-th. Ten flocks of 4 hens each participated in the contest, namely: 25 Greenfoot hens, 11 Wyandottes and 4 Leghorns. All the hens were placed in a wooden american type hen house, with access to a yard of 1000 m², which was partly sheltered. Care was taken that the hens would not be fed too intensely; each hen was given daily: 75 gr. of potatoes, 20 gr. of carrots, 25 gr. of pollard, 20 gr. of cooked blood, 37,5 gr. of oats, 37,5 gr. of barley. The daily food ration of each hen amounted to 215 gr. and consisted of: 17 gr. of albumen, 3,5 gr. of fat and 64,7 gr. of carbonates. In order to diversify the food there was added some bone dust, curd, meat powder etc. For a certain time the system of individual feeding was adopted.

The laying of eggs was controlled by using self shutting nests. Prizes were given to the best nests. The most satisfactory results in regard to the number of eggs as well as to their weight were obtained from the Polish Greenfoot breed, white and brown (see table 1). Considering that the hens participating in the contest were not selected but of an average type, the number of eggs produced although moderate is quite satisfactory.

It was found that the weight of the hen has had no influence on egg laying. As to Greenfoot hens, they produced the largest number of eggs in April, the smallest — in November; March, June, July and August giving about the same results (see table 3 and 4). No hen wanted to brood in February nor in March. Hens of the Greenfoot breed began to brood only in June and July; Wyandottes — in April, while in May 50 p. c. of this breed brooded. The contest has shown that Greenfoot hens brood in unsuitable time (summer), therefore their brooding instinct ought not to be developed. This will result in a continual egg laying during the other breeding time with no loss to the breeding, as eggs may be hatched by other breeds or incubators.

A correlation was observed between the shape and appearance of the hen, and her laying. The length of the back line and the sternum had a good influence. Hens having long breast-bones proved to be good egg layers. The length of the feet and head did not show any correlation, while a certain influence was observed on the production on eggs in hens of thin and developed

combs, broad pelvises and with full development of the back part of the body. Good egg layers proved the most active and clever food gatherers at feeding times.

Egg laying contests are new in Poland and it is for this reason that but a small number of hens are as yet sent for participation. It is certain that in the future the number of hens tested will increase at which time the observations which will be made are sure to be of a much greater value.

Fourth Alabama National Egg Laying Demonstration by L. N. Duncan, Director, Auburn, Alabama.

The Fourth Alabama National Egg Laying Contest came to a close at the end of the 51st week, October 22nd, with an average of 190.38 eggs per hen, thus beating all former records made at Auburn. The averages are based on one thousand birds, although due to high mortality in some entries that number did not finish the year. The average production would be slightly higher if calculated on "hen day" basis.

Five White Leghorn hens finished the 51 weeks with a record above 300 eggs. Ten other hens that have possibilities of making the 300 egg mark in 365 days are being held over until October 30th. Two of these are Rhode Island Reds.

Calendar for Poultry-Breeders. Kalender für Geflügel-Züchter by Fritz Pfenningstorff, Editor Fritz Pfenningstorff, Berlin, W. 57. 700 pages. Price 1 Mark.

This very useful calendar contains interesting articles of famous German scientists, f. i. the modern standpoint of poultry-feeding, digestability-tables etc. by Prof. Lehmann, Göttingen.

The National Egg Laying Test, 1927—28. (Approved and Recognised by the National Poultry Council). Promoted by the „Daily Mail” and The National Utility Poultry Society, in co-operation with the London and North Eastern Railway Company.

This test consists of 406 pens of pure bred and first cross pullets. Each Pen in Section 1 consists of ten Pullets; in Sections 2 to 8 and 10 of five Pullets, in Section 9 of two Pullets, in Sections 11 to 13 of 7 Pullets, and in Section 14 of 4 Pullets. Eggs laid during the first four weeks, weighing $1\frac{7}{8}$ ozs. or more; during the second four weeks those weighing $1\frac{15}{16}$ ozs. or more, and during the remainder of the Test those weighing 2 ozs. or more, are scored at unit value as First Grade. Any Eggs laid during those periods and weighing not more than $\frac{1}{4}$ of an ounce less than their respective weights fixed for First Grade eggs during the before-mentioned periods are assessed as second Grade and scored at unit value, but not more than 100 Second Grade eggs in Section 1; 50 in Sections 2 to 8; 20 in Section 9; 70 in Sections 11 to 13, and 40 in Section 14 are included in the Pen Score for competitive purposes.

Final Report for the 48 weeks, from 25th October, 1927, to 24th September, 1928.

This Test, which terminated on the 24th September, 1928, was the 30th Annual Test, and the last of the series of eleven tests carried out in co-operation with the London and North Eastern Railway Co., and held on their Farm at

Bentley, Suffolk. During the period covered by the latter, a remarkable development has taken place, both in the number of birds engaged, and also in the general average production of the flocks.

In the 1917-18 Test the first of the series, the number of competing birds was 544, and the average production during the 48 weeks run was 146.20 eggs per bird, while in the 1927-28 Test just concluded, the birds numbered 2,155, and the average production reached 189.25 per bird. Such an average as the latter is particularly good, having regard to the size of the flock, but when comparing it with the former, due allowance must be made for the very poor quality of the foods available for Poultry Feeding during the war period. This must necessarily have seriously affected the egg yield. The following table will, however, be of interest in showing that there was an almost uninterrupted growth in the size of the flocks, and also in the egg yield throughout the series of tests at Bentley:

Date of Test.	No. of Birds.	Average production per Bird.	Percentage of deaths.
1917—18	544	146.20	5.33
1918—19	694	155.70	3.60
1919—20	1440	163.39	4.72
1920—21	1497	164.39	4.66
1921—22	1540	156.47 (a)	3.44
1922—23	1616	174.23	4.39
1923—24	2080	176.14	5.24
1924—25	2108	166.67	4.98
1925—26	1553	174.97	5.24
1926—27	3197 (b)	168.14	4.12
1927—28	2155	189.25	5.28

(a) This test was for 44 weeks only.

(b) These figures include a reserve bird in each pen.

What California's Cost of Production Studies reveal concerning Poultry Management by M. W. Buster, Univ. of California. Poultry Science, 1928, p. 49.

Conclusions:

Cost Account and Enterprise Efficiency Studies furnish a valuable survey of the poultry industry. They not only furnish an idea of averages in egg production, mortality, costs and income, but also give a valuable picture of the status of the industry and a gauge of the economic welfare of the people engaged in the industry. Primarily, however, this work provides a basis of determining the value of various management methods based upon the efficiency of the average poultryman. Summaries of his flock management records are of immense advantage to the poultryman, enabling him to compare his results with the average in his district, and also with the results on the most successful farms. And last but not least, these studies provide the Extension Service with much valuable subject matter, which many times can be used much more effectively than that obtained through scientific investigation in controlled experiments.

For the extension worker located in a county this type of work furnishes material for „rounding out” of „truing up” his county extension program in poultry. It also furnishes a basis for forming better contacts with the individual poultryman. His prestige as an authority is considerably increased by reason of his having such figures on the local situation.

As a word of caution, a great of care must be used in inter-

preting the results from such work. Extension people must also be careful in presenting summaries so that they will not be misinterpreted by poultrymen, the press and commercial institutions, such as chambers of commerce, bankers, real estate promoters, etc.

GENERAL

The Indian Runner Duck. Its Origin, History, Breeding and Management by J. A. Coutts, Vice-President of the Indian Runner Duck Club.

Published by „The Feathered World“, 9 Arundel Street, Strand, London, W. C. 2.

Contents: Black Runners, Breeding, Chocolate Runners, Colour and Markings, Diseases and Injuries, Exhibiting, Fawn and White Runners, Feeding, Hatching and Rearing, Historical, Houses, Keeping of Runners, Peculiarities and Standard, White Runners.

50 pages, illustrated with 18 photo's.

Utility Poultry Keeping. Wirtschaftsgeflügelzucht und Haltung by R. Römer, Director Poultry Experiment Station in Halle and Dr. L. Weinmiller, Direktor Poultry Experiment Station in Erding near München. Edited in coöperation with many German poultry officials. Dedicated to Dr. te Hennepe, Rotterdam, the promoter of international understanding in poultry science. Editor Eugen Ulmer, Stuttgart 1928.

Various poultry experts have co-operated in compiling this book which gives a review of all subjects connected with commercial poultry farming. The book contains 275 pages, including 99 illustrations, and explains the modern point of view of German science.

Experiments in incubating. Neuere Erfahrungen auf dem Gebiete der künstlichen Brütung by Dr. Bayreuther, Breddin, Potsdam. Deutsche Landwirtschaftliche Geflügelzeitung, Berlin 1928, p. 777.

Out of 100 eggs which were not turned again after the 12th day, 92 % hatched out. Apparently it is only necessary to turn the eggs during the first half of the hatching period. This is necessary in order to conduct the essential water and food to the chicken. The white of the egg is probably the water reservoir for the chicken and not the humid air in the machine. It is desirable that tests should be made with regard to the movement of the white when the eggs are turned, the percentage of water in the white and the yolk of eggs which have been turned, and eggs which have not been turned, the size of the air bubble in such eggs, and the percentage of water in naturally hatched chickens and those hatched from eggs which have not been turned.

Too high a temperature at the end of the hatching period causes the abdominal cavity to close too quickly so that the yolk cannot be absorbed normally.

The Use of diseased Fowl in experimental Investigations by L. D. Bushnell and W. R. Hinshaw, Dep. of Bacteriology, Kansas Agric. Exp. Station. Poultry Science 1927, p. 17.

Conclusions:

The conclusions to be drawn from results given here are: That experiments of any kind and especially those to determine the performance of birds treated differently, or of different breeds, or birds on different feeds, should be conducted only on birds known to be free from all disease and especially bacillary white diarrhea. It will be impossible to correlate results obtained on well birds and diseased birds held under different conditions, or on the same group of diseased birds obtained at different times. Disease is not a constant factor. Some birds recover while others succumb and still others develop a chronic diseased condition.

The agglutination test is the only one available at present which is at all reliable for the detection of carriers of the organisms of this disease. All birds should be carefully tested before being placed on experiments and even those showing very low reaction should be rigidly excluded from experimental pens.

The Effect on Bone Formation of Winter Sunlight transmitted by a Glass-Substitute by W. C. Russell and O. N. Massengale, New Jersey Agric. Exp. Station, New Brunswick, New Jersey. Poultry Science, 1928, p. 85.

Conclusions:

1. Winter sunlight in the latitude of New Brunswick, New Jersey (32 miles southwest of New York City), when passed through an ultraviolet-transmitting glass substitute, is effective in the prevention of leg-weakness in chicks up to 11 weeks of age. Twenty minutes and also 15 minutes of daily treatment with ultraviolet light from an artificial source, the quartz mercury lamp, are also effective in the prevention of legweakness.
 2. The data suggest that the ultraviolet radiation in the winter sunlight is slightly more effective in the promotion of bone formation than that from the quartz mercury lamp.
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